63d Congress
2d Session

SENATE

Document
No. 615

PNEUMATIC-TUBE POSTAL COMMISSION

REPORT

OF THE

PNEUMATIC-TUBE POSTAL COMMISSION

PRESENTED BY MR. SMITH, OF GEORGIA

October 24, 1914.—Ordered to be printed

WASHINGTON
GOVERNMENT PRINTING OFFICE
1914

PNEUMATIC-TUBE POSTAL COMMISSION.

HON. SIMON GUGGENHEIM,[1] Senator from Colorado (chairman to Mar. 1, 1913).
HON. HOKE SMITH, Senator from Georgia (chairman from Mar. 1, 1913).
HON. WILLIAM O. BRADLEY,[2] Senator from Kentucky (member from Mar. 1, 1913).
HON. FRED L. BLACKMON, Representative from Alabama.
HON. VICTOR MURDOCK, Representative from Kansas.
HON. JOSEPH STEWART, Second Assistant Postmaster General.
JAMES F. BELFORD, secretary to March 1, 1913.
MALCOLM JOHNSTON, secretary from March 1, 1913.

AUTHORIZATION OF JOINT COMMISSION ON PNEUMATIC TUBES.

[From acts making appropriations for the service of the Post Office Department for the fiscal years ending June 30, 1913, 1914, and 1915.]

Provided, That a commission consisting of two members of the Committee on Post Offices and Post Roads, United States Senate, and two members of the Committee on the Post Office and Post Roads, House of Representatives, to be appointed by the chairmen of the respective committees, and the Second Assistant Postmaster General, is hereby authorized to investigate the feasibility and desirability of the Government purchasing and operating the equipment for pneumatic-tube service in the cities in which such service is now installed, together with rights to operate and extend equipment in such cities and elsewhere, and to ascertain the cost at which such purchase may be made. The employment of expert and other assistance is authorized, and the expense of such and of the inquiry shall be paid from the appropriation for service by pneumatic tubes, and said commission shall make a report, with recommendations, to Congress at the earliest practicable date.

Approved, August 24, 1912.

Provided, That the personnel of the membership of the committees and commissions created and provided for in sections one and eight of the act entitled "An act making appropriations for the service of the Post Office Department for the fiscal year ending June thirtieth, nineteen hundred and thirteen, and for other purposes," approved August twenty-fourth, nineteen hundred and twelve, shall continue with the same authorities, powers, and provisions for expenses until final report is made to Congress, which shall be made on or before March fourth, nineteen hundred and fourteen.

Approved, March 4, 1913.

That the personnel of the membership of the committees and commissions created and provided for in sections one and eight of the act entitled "An act making appropriations for the service of the Post Office Department for the fiscal year ending June thirtieth, nineteen hundred and thirteen, and for other purposes," approved August twenty-fourth, nineteen hundred and twelve, shall continue with the same authorities, powers, and provisions for expenses until final report is made to Congress, which shall be made on or before December first, nineteen hundred and fourteen.

Approved, March 9, 1914.

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[1] Senator Guggenheim resigned as chairman and as a member of the commission on Mar. 1, 1913, his term as Senator expiring Mar. 3, 1913, and Senator Smith was elected chairman to succeed him. Senator Bradley was appointed to succeed Senator Guggenheim as a member of the commission.

[2] Senator Bradley died May 23, 1914. No successor was appointed.

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REPORT OF THE JOINT COMMISSION OF CONGRESS AUTHORIZED TO INVESTIGATE THE FEASIBILITY AND DESIRABILITY OF THE GOVERNMENT PURCHASING AND OPERATING PNEUMATIC TUBES FOR MAIL SERVICE, ETC.

Pursuant to authority of law, the joint commission made extensive investigations into the subject of the use and operation of pneumatic tubes for mail service now under contract between the companies which built such tubes and the Postmaster General, and into the cost of construction, maintenance, and operation of such tubes and mail service, and have the honor to report as follows:

The record of the hearings and of the several reports of expert accountants and of the special engineer employed by the Government to assist in said inquiry is set forth in the printed volume "Hearings before the Commission to Investigate the Pneumatic Tube Postal System," Washington, Government Printing Office, 1913, to which consideration is invited. The references in this report are to these "Hearings" unless otherwise stated.

Pneumatic tubes have been used in the transmission of the mails in cities for a period of over 20 years. The first installation of a large tube to expedite first-class mails was made in Philadelphia, Pa., when a 6-inch tube was placed in operation experimentally March 1, 1893, between the central post office and the East Chestnut Street postal station.

The service has been extended from time to time under contracts entered into by authority of Congress until at the expiration of 20 years the Post Office Department has an 8-inch tube system in six arge cities, one line of 10-inch tubes in Boston, Mass., and a short ine of 6-inch tubes in Philadelphia, Pa., with a total mileage of 6.8452 miles, at an annual cost for service thereby of $966,368.40 on June 30, 1914.

The growth of the service is shown in the following table giving he mileage of pneumatic-tube service in operation on June 30 of ach year from 1893 to 1913, viz:

Growth of pneumatic-tube service, 1893–1913.

Fiscal year ending June 30—	Pneumatic-tube service in operation, etc., in—						Total length.	Total pay per annum.	Rate per mile.
	Phila-delphia.	Boston.	New York.	Chi-cago.	St. Louis.	Brook-lyn.			
	Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*		
93	(1)						0.55		
94	0.55						.55	$4,000.00	$7,272.00
95	.55						.55	3,450.00	6,200.00
96	.55						.55	3,450.00	6,200.00
97	.55						.55	3,450.00	6,200.00
98	1.46	0.74	5.85				8.05	232,085.00	28,830.00
99	1.46	.74	5.85				8.05	222,266.00	27,610.00

(1) March 1, general post office to East Chestnut Street Station (experimental).

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Growth of pneumatic-tube service, 1893–1913—Continued.

Fiscal year ending June 30—	Pneumatic-tube service in operation, etc., in—						Total length.	Total pay per annum.	Rate per mile.
	Philadelphia.	Boston.	New York.	Chicago.	St. Louis.	Brooklyn.			
	Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*		
1900	1.46	0.74	5.85	....	....	....	8.05	$222,266.00	$27,610.00
1901	1.46	.74	5.85	....	....	....	8.05	222,266.00	27,610.00
1902	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
1903	1.382	4.26	6.853	....	....	....	12.495	201,095.00	16,094.00
1904	1.382	6.89	6.853	....	....	....	15.125	218,470.00	14,444.00
1905	1.382	6.89	6.853	8.88	2.09	....	26.095	401,023.00	15,367.00
1906	4.002	6.89	6.853	8.88	2.09	....	28.715	445,563.00	15,516.00
1907	3.9	6.652	7	7.31	1.68	....	26.542	451,219.00	17,000.00
1908	6.022	6.652	9.3998	7.41	1.85	....	31.3338	532,679.00	17,000.00
1909	7.9095	6.652	20.3987	7.41	1.9465	1.35	45.6667	776,339.04	17,000.00
1910	9.987	6.774	21.2763	9.2058	1.9465	1.35	50.5396	859,173.20	17,000.00
1911	9.9999	6.774	25.173	9.2058	1.9465	1.35	54.4492	925,636.40	17,000.00
1912	9.9999	6.774	25.173	9.6017	1.9465	1.35	54.8451	932,366.70	17,000.00
1913	9.9999	6.774	25.781	9.6017	1.988	1.35	55.4946	943,408.00	17,000.00

[1] No appropriation; all service discontinued.

The following is a statement for each city of the contracting company, term of contract, and the points and distances between which tubes are laid and service is performed. This is compiled from the records of the department as of June 30, 1914, and shows some changes and extensions which are not indicated in the printed testimony before the joint commission.

City and State.	Name of contractor.	Term of contract.	Points between which pneumatic tubes are laid and service is performed.		Distance.
			From—	To—	
					Miles.
Boston, Mass	Boston Pneumatic Transit Co.	Nov. 1, 1906, to June 30, 1916.	General post office	North Postal Station	0.8399
			do	South Postal Station	.7046
			South Postal Station	Essex Street Station	.4536
			Essex Street Station	Back Bay Station	1.1445
			do	Station A	1.2119
			Station A	Roxbury Station	1.0340
			Roxbury Station	Uphams Corner Station	1.3755
Brooklyn, N. Y.	New York Pneumatic Service Co.	do	General post office	Station L	1.3500
New York, N. Y.	do	do	General post office, New York	General post office, Brooklyn	1.6548
			General post office, New York, via Wall Street Station.	Station P	.9450
			General post office via Stations D, Madison Square, and F.	Grand Central Station	4.1643
			General post office	Hudson Terminal Station	.4536
			Station A	Station O	1.3666
			Station O	Station C	.6722
			do	Station E	.9561
			General post office via Station V	Station A	1.5321
			Station E	Pennsylvania Railroad terminal	.7342
			Pennsylvania Railroad terminal	Times Square Station	.8704
			Times Square Station	Station G	1.1719
			Station G via Station N	Station W	1.9885
			Station W	Station H	1.123
			Station H	Station I	1.1916
			Station I	Station J	.7143
			Station J	Station L	1.1208
			Station L	Station U	1.2462
			Station U	Station K	.8287
			Station K	Station Y	1.1046
			Station Y	Grand Central Station	1.3112
			Grand Central Station	Pennsylvania Railroad terminal	1.5489
Philadelphia, Pa.	Pneumatic Transit Co	do	General post office	Reading terminal	.2785
			do	Station S	1.41
			do	Southwark Station	1.0155
			do	Penn Square Station	.7267
			do	Bourse Station	.56
			Penn Square Station	Station J	1.2457
			Station J	Station C	.8825
			Station S	Station O	1.21
			Southwark Station	Station D	.872
			Station O	Fairhill Station	.624
			Fairhill Station	North Philadelphia Station	1.175

City and State.	Name of contractor.	Term of contract.	Points between which pneumatic tubes are laid and service is performed.		Distance.
			From—	To—	
					Miles.
Chicago, Ill	Chicago Postal Pneumatic Tube Co.	Nov. 1, 1906, to June 30, 1916.	General post office	Illinois Central Depot	1.27
			Illinois Central Depot	Twentieth Street Station	1.00535
			Twentieth Street Station	Armour Station	1.04535
			Armour Station	Stock Yards Station	2.73
			General post office	La Salle Street Depot	.55
			La Salle Street Depot	Union Depot (Station U)	.8249
			Union Depot (Station U)	Canal Station	.403
			General post office	Chicago Avenue Station	2.2057
St. Louis, Mo	St. Louis Pneumatic Tube Co.	July 1, 1907, to June 30, 1916.	do	Bridge Station	1.988

[1] A portion of the service began at Chicago July 1, 1907.

The mileage of double lines of tubes in the several cities where service is now under contract, and the annual cost of service, on June 30, 1914, is shown in the following table:

Mileage of double lines of tubes contracted for and in operation for mail service June 30, 1914.

City.	Contractor.	Total service contracted for—		Total service in operation June 15, 1914.	
		Length.	Annual pay.	Length.	Annualpay.
		Miles.		*Miles.*	
Boston	Boston Pneumatic Transit Co.	6.6523	$113,099.10	[1] 6.7740	$115,158.00
New York	New York Pneumatic Service Co.	28.6401	486,881.70	26.699	453,882.00
Brooklyn	do.	1.350	22,950.00	1.3500	22,950.00
Philadelphia	Pneumatic Transit Co.	10.029	170,493.00	9.9999	169,998.30
Chicago	Chicago Postal Pneumatic Tube Co.	17.966	305,422.00	10.0343	170,583.10
St. Louis	St. Louis Pneumatic Tube Co.	3.470	54,821.15	1.9880	33,796.00
Total		68.074	1,153,656.95	56.8452	966,368.40

[1] Service in operation in excess of original authorization due to changes in site of postal stations and subsequent extensions, 0.1217 miles; annual pay, $2,068.90.

A brief history of the development of pneumatic-tube mail service in this country is given in Appendix A.

INVENTORIES OF PNEUMATIC-TUBE PROPERTIES.

The pneumatic-tube companies operating the service under contract filed with the commission inventories of pneumatic-tube lines and other property owned by said companies. These inventories include an enumeration of the lines of tubes laid through which mail service is performed, giving date of installation and the condition of line; of all machinery, apparatus, and appurtenances employed in the operation of the service, the year of installation, where practicable, and the cost and condition of the same; and a list of patents held and controlled under which the companies claim protection.

These inventories of lines and equipment are found in the printed evidence as follows:

For New York and Brooklyn, N. Y., pages 287 to 290, inclusive.
For Philadelphia, Pa., pages 300 to 311, inclusive.
For Chicago, Ill., pages 327 to 329, inclusive.
For Boston, Mass., pages 364 to 366, inclusive.
For St. Louis, Mo., pages 370 to 371, inclusive.

The list of patents of the American Pneumatic Service Co. is found on pages 34 to 39, inclusive.

The list of patents for the exclusive license for using, selling, or operating in the city of Philadelphia by the Pneumatic Transit Co. is found on pages 115 and 116 and pages 211 and 212.

In case of purchase by the Government, the terms of sale should include all necessary rights under these patents and all patents subsequently granted to the parties in interest or any of them, to use any machinery or device covered thereby for the purposes of transportation and handling of United States mails.

The franchises under which the pneumatic-tube companies are operating in the several cities are set forth in the printed testimony, as follows:

For Boston, Mass., on pages 387 and 388.
For New York and Brooklyn, N. Y., on pages 388 to 391, inclusive.
For Philadelphia, Pa., on pages 399 to 401, inclusive, and on pages 114 and 115.
For Chicago, Ill., on pages 391 to 398, inclusive.
For St. Louis, Mo., on pages 398 and 399.

The following indicates the terms of the franchises with respect to the principal features as to use, control, expiration, etc.:

Tubes:
  Boston, no limitation on the size.
  New York, diameter not to exceed 3 feet, under New York Mail & Newspaper Transportation Co. charter.
  Chicago, 8 inches.
  St. Louis, no limitation.
  Philadelphia, no limitation.
Use:
  Boston, carriage of mail, messages, merchandise, and other articles.
  New York, letters, parcels, packages, mails, messages, and other property.
  Chicago, restricted to United States mails.
  St. Louis, restricted to United States mails.
  Philadelphia, restricted to United States mails.
Control:
  Boston, commissioner of public works.
  New York, commissioner of public works.
  Chicago, commissioner of public works.
  St. Louis, board of public improvements.
  Philadelphia, department of public works.
Removal:
  Boston, city council may require removal at any time.
  New York, no provision.
  Chicago, no provision.
  St. Louis, no provision.
  Philadelphia, no provision.
Repairs to streets:
  Boston, person opening surface of street must make repairs for 12 months.
  New York, streets must be restored and maintained.
  Chicago, deposit covering estimates for repair costs must be maintained.
  St. Louis, deposit covering estimates for repair costs must be maintained.
  Philadelphia, repairs must be maintained for three years.
Duration of franchise:
  Boston, occupancy of streets revocable on order of city council.
  New York, 25 years from 1897.
  Chicago, 20 years from October 12, 1903, with right of purchase after October 12, 1913.
  St. Louis, 25 years, presumably from June 10, 1903.
  Philadelphia, no term.
Franchise payments:
  Boston, none.
  New York, Tubular Dispatch Co. paid 2 per cent of gross earnings; New York Mail & Newspaper Transportation Co., $1 for every 100 yards of tubes.
  Chicago, 3 per cent of gross revenue for the first four years, 5 per cent of the gross revenue for the remaining 16 years.
  St. Louis, none.
  Philadelphia, none.
Miscellaneous:
  New York, New York Mail & Newspaper Transportation Co. has contract with Brooklyn Bridge for period terminating March 1, 1922.

From the report of Mr. Nathan B. Williams, p. 378. The Chicago franchise provides that at the expiration of the grant all the tubes in the ground shall become the absolute property of the city of Chicago. (Franchise to Chicago Postal Pneumatic Tube Co., p. 394.) This is the only franchise that has such a provision.

In case of purchase by the Government of the tubes laid in Chicago, Ill., the city of Chicago should release to the United States all claims for reversion or other rights reserved under the charter granted the Chicago company.

CONDITION OF PNEUMATIC TUBES AND MACHINERY AND APPARATUS.

In addition to the detailed statement required from the pneumatic tube companies as to the date of installation and the condition of tubes and machinery the commission employed a mechanical expert, Mr. Alfred Brooks Fry, consulting engineer and superintendent United States public buildings, New York City, to make a detailed examination of and report upon the properties and their condition. His report, with exhibits, including reports of assistants, is set forth in full on pages 243 and following.

In general.—The condition of the tubes laid underground could be determined only by an examination of sections removed for that purpose. Such physical examination of underground tubes in cities such as those in which the service is in operation if carried to any great extent would be impracticable because of time required, derangement to the Postal Service, and obvious expense. Sections, however, were taken up in New York and Brooklyn and examinations made of the same, as well as examinations made of sections theretofore removed in other cities. In some cases these tubes had been laid as early as in 1898. Their general condition was found to be good, there being very slight internal wear and, except where peculiar conditions resulted in electrolytic action, no appreciable deterioration in the outward structure of the tubes was found. The sections removed in Brooklyn were from locations where some such electrolytic action on the tubes might be anticipated to have existed. This, however, was confined to one length. The loss from external rusting was found not material. The deepest pit due to electrolytic action was drilled and found to have a depth of only sixteen-hundredths of an inch below the original pipe surface. This would indicate a length of life of 30 years where these unfavorable conditions exist. However, such condition is not a common one.

The reports of postmasters as to the number of stoppages during the calendar year 1912 indicate that the mechanical condition was good.

New York and Brooklyn, N. Y.—The commission's mechanical expert reported the condition of underground tubes in New York and Brooklyn to be good, and the going condition of the plant and apparatus, including the properties inventoried by the company, as very good, subject to the notations in said inventory (pp. 250 and 287 to 290, inclusive).

Philadelphia, Pa.—The commission's mechanical expert reported the condition of underground tubes in Philadelphia to be good, both externally and internally, showing only very slight evidence of wear (p. 261), and the going condition of the plant and apparatus, including the properties inventoried by the company, to be very good, subject to the notations in said inventory (pp. 260 and 261 and 300 to 306, inclusive).

Chicago, Ill.—The commission's mechanical expert reported the condition of underground tubes in Chicago to be generally good, both externally and internally. The 12-foot length of tube removed for examination showed somewhat greater wear than sections removed in other cities. There was noted, however, some probable leakage in the joints. Vaults were found in fair condition except as to drainage (pp. 268 and 269; also 363 and 364). The going condition of the plant and apparatus was found to be in less favorable condition than that in other cities. The reports show many repairs needed and that a large sum of money will be required to place the plant in first-class operating condition (pp. 268 and 337 to 350, inclusive).

Boston, Mass.—The commission's mechanical expert reported the condition of underground tubes in Boston to be good. A thorough examination of the external surfaces of tubes exposed in manholes and in streets where uncovered by excavations for the construction of subways showed practically no deterioration on account of corrosion or electrolysis. Over 300 feet of 10-inch double lines of tubes laid in 1901 were exposed by subway construction and no appreciable corrosion from any cause was found. Careful examination and measurements were also made of interior sections of tubes removed from lines laid in 1897 and the wear in general on the tubes by reason of carrier friction was found to be inconsequential (pp. 274 and 366 to 369, inclusive). The going condition of the plant and apparatus, including the properties inventoried by the company (pp. 364 to 366, inclusive), was reported to be very good (p. 274).

St. Louis, Mo.—The commission's mechanical expert reported the condition of underground tubes in St. Louis to be substantially as good as when first installed. This is based on freedom from stoppages, on the fact that the St. Louis water department reports no appreciable damage done by electrolysis in the district covered by the tubes, that voltmeter tests have indicated only a fraction of a volt of stray current pressure found anywhere; and that the soil through which the St. Louis lines are laid is very free from agents producing chemical action in cast-iron pipe (pp. 278, 371, and 372). The going condition of the plant and apparatus, including the properties inventoried by the company (pp. 370 and 371), was found to be very good (p. 278).

DEVELOPMENT AND EXPERIMENTS.

The experiments of the past 20 years, and particularly those of the last 5 years, have resulted in the development of improved operating machinery, which may now be regarded as standard. Apparently the "experimental stage" has passed.

The results obtained through actual operation under varying conditions in several cities seem to indicate that 8-inch tubes may be regarded as well adapted for the transmission of first-class mail.

CAPACITY, ADVANTAGES, AND LIMITATIONS OF PNEUMATIC-TUBE SERVICE.

Capacity.—During the hours of maximum use of the tubes the frequency of dispatches by carriers is four carriers per minute in each direction. This is on a headway of 15 seconds and is a practical frequency regulated upon the actual number of carriers that can be filled, closed, transmitted, and operated or relayed between stations.

Therefore, the theoretic efficiency of the tubes may be calculated on a frequency of dispatch of four carriers per minute in each direction for 20 hours a day. The theoretic effective capacity of the tubes on this basis would be 240 carriers per hour, or 4,800 carriers per 20-hour day in each direction, or 9,600 carriers in both directions. The number of letters that could be forwarded at this rate, calculated on 450 letters to the carrier, would be 108,000 per hour or 2,160,000 letters in each direction per day of 20 hours. It must be borne in mind that this is the theoretic efficiency of the tubes and the statistics of the tube capacity hereinafter given are based upon this theoretic maximum.

It has been demonstrated by the count of mails transmitted through the various tubes during the week ended March 8, 1913, as well as previous counts made, that the present 8-inch tubes have ample capacity to accommodate all first-class mail available for dispatch, except during the rush hours in the morning and evening when the heavy mails are being received from and dispatched to the important railway post-office trains. It is necessary at such times to dispatch some of these mails by wagon or automobile service.

It will be observed that in the space of 5 years, since the last commission's report, there has been a considerable increase in the percentage of the tube capacity utilized.

Although the tube systems were extended about 19 miles, principally in the residence districts where the volume of mails is very much less than in the business sections, it will be seen that the tube mileage on which under 10 per cent of capacity was used has been reduced from 15.75 miles in 1908 to 11.26 miles in 1913, or 20.30 per cent instead of 42.71 per cent of the total length of the tubes.

There has been a decided increase in the mileage and tube capacity used in those portions of the tubes where from 10 to 20 per cent and from 30 to 60 per cent of the full capacity is used.

The reports of postmasters show that the greatest percentage of use in 1913 was in New York between Madison Square and Grand Central Stations, being 70 per cent as against 66.6 per cent between the same points in 1908; and the smallest was in Philadelphia between Southwark Station and Station D, being 4.5 per cent as against 2.2 per cent in Boston between Roxbury and Uphams Corners in 1908.

The following table shows the percentage of tube capacity utilized in the several systems in March, 1913, in comparison with percentages in 1908. These percentages are computed on the basis of the *theoretic maximum* efficiency of the tubes as above described.

Percentage of tube capacity utilized, 1913.

	4.5 to 10 per cent.	10 to 20 per cent.	20 to 30 per cent.	30 to 40 per cent.	40 to 50 per cent.	50 to 60 per cent.	60 to 70 per cent.	Length of tube.
	Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*
Boston	1.43	2.03	1.24	0.47	0.87	0.73	....	6.7740
New York	....	6.11	4.12	6.80	4.78	2.58	1.39	25.7810
Brooklyn	1.35	....	....	....	....	....	....	1.3500
Philadelphia	3.39	5.88	....	....	....	.72	....	9.9999
Chicago	4.54	2.04		....	1.67	.82	.55	9.6017
St. Louis	.55	....	1.43	....	....	....	....	1.9880
Total	11.26	16.06	6.79	7.27	7.32	4.85	1.94	55.4946
Per cent of miles of total length of tube, 1913	20.30	28.94	12.23	13.10	13.19	8.74	3.50	100.00
Total mileage of tubes, 1908	15.75	5.375	7.175	2.40	.42	1.35	4.41	36.88
Per cent of miles of total length of tube, 1908	42.71	14.56	19.46	6.51	1.14	3.66	11.96	100.00

As shown above, it appears that the theoretic maximum capacity of the tubes is not always utilized. This results from the fact that there is not first-class mail on hand at all stations at all times during the 20 hours of the day that the tubes are operated to employ the tubes in its transmission all the time. This is not an objection to the tubes as a means of transportation. The only question that it could suggest is whether the use of tubes is justified where the efficiency percentage is very low from lack of mail to transport. In most of these cases, however, it is found that such sections are parts of a general system of tubes and that it would be inadvisable to eliminate these parts and thereby impair the usefulness of the whole system as such.

Limitations.—In addition to the limitations in the use of the tubes resulting from the lack of the maximum quantity of mail that could be dispatched, there are others which result from the nature of the tubes themselves.

Tubes of 8-inch capacity are not adequate in size to transport large articles. Consequently they are used as a rule for the transportation of first-class matter and registered mail.

Because of the size of the tubes and the consequent limitation upon the quantity of mail that can be transported through them in a given time, there are certain hours during the day in New York, Philadelphia, and Chicago when between certain points the capacity of the tubes is unequal to transmit the whole of the first-class mail which must be handled. The reports submitted by the postmasters at these offices covering operations of the tubes for the week ended March 8, 1913, indicate that between certain hours of the morning, during which large quantities of mail are received from incoming postal-car trains, and between certain hours of the evening, during which the heavy business mails are dispatched to railroad stations in connection with important outgoing trains, the pneumatic-tube service is not adequate to carry the maximum quantity of first-class mail.

It must not be inferred, however, from this fact that the mails are actually delayed thereby in their subsequent disposition. In the case of incoming mails the first carriers sent provide work for the distributors who are kept going by subsequent dispatches. In the case of outgoing mails they may be dispatched in bulk to the trains in advance of closing time by automobiles or wagons for distribution, pouching, or storing. Supplemental dispatches may be made by tubes, thereby affording the public the latest possible closing for dispatch by each outgoing train.

The following statement shows the extent of the inadequacy of the tubes in the cities named:

Place.	From—	To—	From (hours)—	To (hours)—	Pieces of first-class mail dispatched by other means.	
					Number.	Per cent of number dispatched by tube.
New York	General post office	Madison Square	6.30 p.m.	7.30 p.m.	97,880	1.33
			[1]4.38 p.m.	8.58 p.m.	270,625	17.50
			[2]12.48 p.m.	4.00 p.m.		
Do	Madison Square	Grand Central	[1]6.00 p.m.	7.30 p.m.		
Do	Station F	Madison Square	4.00 p.m.	8.00 p.m.	85,833	11.66
			[1]1.00 p.m.	4.00 p.m.		
Do	Hudson Terminal	General post office	[1]4.30 p.m.	9.18 p.m.	1,173,807	34.50
			[1]1.40 p.m.	9.18 p.m.		
Philadelphia	Bourse	Central post office	6.00 p.m.	7.00 p.m.	26,575	3.80
Chicago	General post office	Illinois Central	7.00 a.m.	8.00 a.m.	21,600	12.84
Do	do	La Salle	7.00 a.m.	9.30 a.m.	129,600	19.50
			6.00 p.m.	9.30 p.m.	172,800	30.00
Do	La Salle	Union	7.00 a.m.	10.00 a.m.	206,900	28.59
			6.00 p.m.	10.00 p.m.	245,700	36.36
Do	Union	Canal	6.00 p.m.	10.00 p.m.	175,500	31.01

[1] Daily except Saturday and Sunday.

[2] Saturday.

The reports received from the postmasters at Boston, Mass., Brooklyn, N. Y., and St. Louis, Mo., indicate that the pneumatic-tube service in those cities is capable of accommodating all first-class mail.

Speed.—Contracts for this service required a speed of not less than 30 miles an hour between any two postal stations. The investigations and reports made indicate that this rate of speed is maintained in practice.

On long routes upon which intermediate stations are located, requiring rehandling of the carriers, this rate of speed is not maintained, but runs from 20 to 25 miles per hour, according to the number of relay points. This, however, greatly exceeds the speed of the vehicular service, due principally to the operation of traffic regulations. While this is true it must be remembered that if the volume of mail to be dispatched at any one time exceeds a certain limit the entire amount may be transported by automobile or wagon in bulk in less time than the transportation can be accomplished for the entire amount by the use of smaller dispatches at the increased rate of speed. As an offset to this, however, mail dispatched by the quicker means and in smaller quantities is always ready for handling, distribution, or delivery as soon as it is received at the point of destination, and thus the actual work of handling in many cases is facilitated greatly.

Availability.—A special feature of the pneumatic tubes, which is peculiar to them and to no other facility used in the postal service, is their availability. The facility is available at all times with equal efficiency during the entire period of operation. Excepting when the tubes are out of commission by reason of stoppage, which rarely occurs for causes herein elsewhere shown, mails may be transported through them between any stations connected at any moment.

The great importance of this feature can not be overestimated. In some of the cities the entire amount of first-class mails is handled through the tubes. In all the cities all the local first-class mails are so handled and also a large amount of other mails. Thus, by reason of the constant availability of the tube lines all this large body of first-class mail is advanced in delivery very materially.

The tubes are not subject to the interruptions which occur to other means of transportation—for instance, screen wagons, automobiles, and electric cars—nor to the delays consequent upon the congestion of streets. Extraordinary conditions of weather, such as snows, excessive cold and heavy rains, and also disputes between employer and employee in the contract service result in more or less interference or delay in other means of transportation, but these causes never affect the tube service. Upon occasions of this kind when other means of transportation were not available the tubes in New York particularly have enabled the post office to handle first-class mail without any material interruptions or delays. Upon this point the postmaster at New York makes the following statement:

> In connection with the communication addressed you to-day furnishing data relative to the pneumatic tube and vehicular service in this city, called for by your letter of the 6th and telegram of the 18th instant, including information as to the service which would be required if the pneumatic-tube system were to be discontinued, your attention is invited to the fact that since February 13, 1914, the automobile service on routes 407012 and 407013 in this city, has been seriously interfered with because of the condition of the streets, due to heavy snowstorms and subsequent thaws and freezing, which also on certain days interfered as well with the operation of the elevated railroad system, badly crippling the same; and while matter of the second, third, and fourth classes scheduled for conveyance by automobiles on the routes named, was moved, the contractors were unable to adhere to the regular schedules, and on some days to even approximate them, resulting in misconnections and delays of many important mails.
>
> However, owing to the availability of the pneumatic-tube system installed in this city and Brooklyn, N. Y., for the dispatch of first-class ordinary and registered mail, that class of matter was subjected to no delay in its transmission between the points supplied by the system, affording corresponding satisfaction to the public both in the business and residential sections, and obviating cause for complaint in connection with the transmission of such matter.
>
> Had the transmission of first-class matter been dependent upon the automobile service, or the elevated railroad service during this period, great dissatisfaction to the public would assuredly have existed, and numerous complaints resulted therefrom.
>
> I am bringing this matter to your attention because I believe that in giving consideration to the matters treated in my letter of even date you will wish to give due weight to the value of the pneumatic-tube system, especially where surface conditions are interfered with, which do not affect the pneumatic tube system, leaving it in full operation, and in this connection I desire to draw attention to the fact that in addition to making possible a satisfactory transmission of first-class local mail, the value of the pneumatic-tube system in the transmission of this class of matter for connection with outgoing railroad trains, as well as its prompt forwarding from incoming trains to the various points of delivery, is of the greatest importance and can not be overestimated.

Security.—This means of transportation affords absolute security to the registered mails, postal funds, postage stamps, and valuable letters so far as instances of risk are concerned which ordinarily attach to means of transportation. There is no opportunity whatever for loss by theft or fault of employees, excepting at the point of dispatch and of receipt. Under the conditions under which mails are so dispatched and received this is almost impossible.

Use of tubes for other classes of mails.—The principal use to which the tube service can be devoted is the transportation of first-class, registered, and special-delivery mails. Under certain conditions, however, the tubes are used for the transmission of other classes to a small extent. The following statement shows the quantity of mail received and dispatched by tubes, first-class and other classes separately, during the week ended March 8, 1913:

	Pieces first class received.	Pieces first class dispatched.	Pieces other classes received.	Pieces other classes dispatched.	Total pieces of first class received and dispatched.	Total pieces other classes received and dispatched.
New York	32,021,837	32,306,129	1,211,685	933,947	64,327,966	2,145,632
Brooklyn	830,520	437,778	3,255	1,127	1,268,298	4,382
Boston	10,417,664	11,195,832	192,205	207,736	21,613.496	399,941
Philadelphia [1]	19,176,469	18,861,847	2,858,605	2,987,055	38,038,316	5,845,659
Chicago	22,937,176	21,979,636	28,336	56,857	44,916,812	85,190
St. Louis [1]	1,499,220	1,393,110	13,437	39,253	2,892,330	52,690

[1] Number of pieces computed from pounds stated in table following p. 403 at 44.85, number to pound as shown by special weighing of the mails, 1907.

Reliability.—According to the reports made by postmasters, the present tube systems are very reliable. The number of failures to perform service is small, and in the majority of cases the interruptions were of short duration. The following statement shows the number of failures in each city and the percentage of stoppages due to outside causes for the year 1912:

	Length.	Total number of stoppages.	Number due to outside causes.	Per cent of stoppages due to outside causes.	Gross stoppages per mile.	Net stoppages per mile.
	Miles.					
New York and Brooklyn	26.523	97	17	17.5	3.66	3.05
Philadelphia	9.999	43	12	27.9	4.30	3.10
Boston	6.774	8	0	0.0	1.20	1.20
Chicago	9.6017	84	30	35.7	8.75	5.63
St. Louis	1.9465	11	7	63.6	5.64	2.05

In this table the term "outside causes" refers to stoppages due to street settlement or disturbance, alterations, and failure of current supply from the outside. "Gross stoppages" means stoppages from all causes. "Net stoppages" are the differences between the gross stoppages and the stoppages due to outside causes.

Postal statistics in their relation to the pneumatic-tube service.—The following tables show the pieces of first-class mail handled in the several cities in the postal districts embraced on the tube lines, together with other statistics concerning population, postal revenues, etc.:

Postal statistics.

Cities.	Population, census 1910.	Gross postal revenues for year ended 1913.	Collections daily in the tube district during 1913.		Pieces first class collected daily in the tube district.	Local mail originating daily in the tube district for delivery in same city (pieces).	Deliveries daily in the tube district during 1913.	
			Maximum.	Minimum.			Maximum.	Minimum.
Boston	670,585	$7,663,828.31	32	5	593,491	393,406	6	4
New York	4,766,883	27,712,278.01	30	15	3,071,078	1,123,106	9	6
Brooklyn	(1)	2,937,810.13	24	10	102,278	56,920	7	5
Philadelphia [2]	1,549,008	8,029,545.51	22	3	800,252	511,963	6	4
Chicago	2,185,283	23,551,532.01	27	12	2,459,518	327,034	8	6
St. Louis [2]	687,029	5,092,750.65	15	12	157,873	(3)	6	5
Total	9,858,788	74,988,643.62	....	....	7,184,490	2,412,429	....	....

[1] Combined with New York.

[2] Number of pieces computed from pounds stated in table following p. 403, at 44.85 number to the pound, as shown by special weighing of mails, 1907.

[3] Not reported.

Postal statistics—Continued.

Cities.	Pieces first class delivered daily.	Special-delivery mail handled daily (pieces).		First-class mail dispatched daily (pieces).		First-class mail received daily (pieces).		First-class mail actually advanced daily by the tubes (pieces).
		Dispatched	Delivered.	By tube.	Other means.	By tube.	Other means.	
Boston	613,509	1,086	984	1,599,405	486,955	1,488,238	455,868	(1)
New York	2,797,044	4,500	5,049	4,615,161	4,925,688	4,574,548	4,381,493	3,703,600
Brooklyn	182,579	188	365	62,540	11,872	118,646	15,205	181,185
Philadelphia	579,116	1,469	1,206	2,694,550	711,077	2,739,496	608,343	746,695
Chicago	1,259,614	2,742	2,482	3,139,948	1,954,875	3,276,739	253,200	744,945
St. Louis	352,646	225	198	199,016	14,740	214,174	19,420	5,490
Total	5,784,508	10,210	10,284	12,310,620	8,105,207	12,411,841	5,805,529	5,381,915

Cities.	Percentage of all first-class mail transmitted through the tubes.		Percentage of first-class mail advanced by the tubes.	Carriers sent in one day.	Number of carriers sent in one hour.		Average percentage of carrier capacity utilized.	
	Dispatched.	Received.			Maximum of most used line.	Maximum of least used line.	Maximum.	Minimum.
	Per cent.	*Per cent.*	*Per cent.*				*Per cent.*	*Per cent.*
Boston	76.62	76.55	(1)	16,992	181	16	52.00	5.16
New York	48.38	51.07	80.3	75,493	240	24	70.00	5.00
Brooklyn	84.00	88.70	100.0	731	51	....	7.62	....
Philadelphia	79.19	81.90	27.7	19,963	251	27	67.80	4.50
Chicago	61.68	92.83	23.7	21,611	239	44	70.91	5.18
St. Louis	93.20	91.75	2.8	1,659	210	74	28.31	6.25

[1] Not reported.

The statistics as to number of pieces handled by tubes are based on count for seven days, including Sunday. The service on Sunday is only light compared with that on week days; however, 7 has been used as a divisor to secure the average daily number.

In the above statement only the first-class mails handled in the postal district embraced on the tube lines have been taken into account and represents only a part of such mails handled in each city. The population and postal revenues are given for the entire city in each case. The combined postal revenues for the fiscal year ended June 30, 1913, amounts to $74,988,643.62, which is 28.13 per cent of the postal revenue for the entire country.

COST OF CONSTRUCTION.

It has been found to be exceedingly difficult to determine the cost of construction on account of large sums being charged to construction which were spent in development and experiment, in obtaining franchises, patents, and capital, and for interest, legal and organization expenses. The major portion of these various expenditures occurred during the first 10 years, which may be called the experimental period. Unquestionably large sums of money have been expended in the development of standard machinery, and other materials, and the relocation and abandonment of lines due to changes in sites of post offices, postal stations, and railroad stations.

The companies claim the total cost of construction to be $10,234,112.03, and the cash cost of construction to be $7,262,402.64. The American Audit Co. gives the cost of construction as $5,802,564.29.

Mr. Fry estimates the cost of duplication as $4,290,519.87. According to the estimates made, the cost of duplication per mile in the various cities would run from $62,000 per mile in St. Louis to $87,151 per mile in New York. This is due to variations in the nature of the soil and subsurface conditions.

Boston.—The Boston Pneumatic Transit Co. claim their total cost of construction for Boston was $422,408.06 (cost per mile, $62,358); cash cost, $384,418.12 (cost per mile, $56,750) (p. 275; report of Mr. Fry).

According to the American Audit Co.'s estimate the cost of construction to December 31, 1912, appears to be $380,238.12, exclusive of items of "profit on contracts." This also excludes the cost of small tubes not used in mail service (p. 237 and 238).

New York and Brooklyn.—The New York Pneumatic Service Co. claim their cost of construction to March 31, 1912, for New York and Brooklyn, was—total cost, $6,527,046.45; cash cost, $5,511,645.38 (p. 253; report of Mr. Fry).

Mr. Fry states that these costs include "development and experiment, franchises, legal expenses, patents, interest, cost of obtaining capital, organization expenses, deficit during early years of operation, and loss by compulsory abandonment of lines incident to changes in location of post offices, substations, etc." (p. 253).

On the general subject concerning New York he states:

> Undoubtedly large sums of money have been expended in experiments that were included and charged to early construction. This applies to such features as tubes, bends, transmitters, receivers, compressors, carriers, time locks, and numerous minor details. Many forms of carriers, of terminal and receiving apparatus, have been made and tested, and many types of tube fittings more or less experimental, and finally found unsuitable, have been sold as junk (p. 252).

Mr. Fry says further:

> Before expressing any definite opinion on the actual construction costs in New York I feel constrained to await further information, if it can be obtained, from the pneumatic company and from the auditors and accountants that have been employed by the commission, because what can be termed the engineering and construction costs entering into this matter probably do not represent over 40 per cent of the total cash cost entered on the books of the company. However, in order that some estimate can be fairly made, under the heading "Probable operating cost under Government ownership" (New York tube system, including Brooklyn lines), I have used both the claimed cash cost of the company for said lines as well as the American Audit Co.'s report of February 14, 1913, which gives the ledger cost of said lines as $3,244,648.30 (pp. 253, 254).

The American Audit Co. estimated the cost of construction to December 31, 1912, as $3,244,648.30 (pp. 237; 238, 239). The Audit Co. report further upon this estimate as follows:

> Referring to Exhibit K, it will be found that the original construction of the New York and Brooklyn tubes was done under contract by C. J. Ryan & Co. for the Tubular Dispatch Co., and by Belden & Co. for the New York Mail & Newspaper Transportation Co. The Ryan contract was settled for $590,000, $100,000 of which was paid in stock. The Belden contract amounted to $400,000 and was paid $200,000 in stock and $200,000 in bonds of the New York Mail & Newspaper Transportation Co. We have therefore been compelled to take these two construction charges to account at their face value and have included these charges in "Direct construction" items as shown on Exhibit I (p. 218).

Chicago.—The American Pneumatic Service Co. claim their cost of construction for Chicago was—total cost, $1,002,960.39; cash cost, $614,482.19 (p. 270; report of Mr. Fry).

In regard to this Mr. Fry states that the more general remarks regarding construction cost in New York City apply to a very considerable extent to Chicago as well.

The American Audit Co. estimated the cost of construction to December 31, 1912, as $905,188.76, exclusive of item of "Loss on contract" (pp. 237, 239, 240). It is observed that this amount includes an item of $275,000 "Stock of Chicago Pneumatic Service Co. held as an investment by American Pneumatic Service Co. given account of franchises" (p. 240).

St. Louis.—The American Pneumatic Service Co. claim their cost of construction was—total cost, $275,121.99; cash cost, $108,856.95 (p. 278; report of Mr. Fry).

The American Audit Co. estimated the cost of construction to December 31, 1912, as $149,489.11, exclusive of item of "Profit charged to construction" (pp. 237 and 240).

Philadelphia.—The Pneumatic Transit Co. claim their total cost of construction for Philadelphia in their brief of March 3, 1913, including tangible and intangible property, was $2,006,575.14 (p. 264; report of Mr. Fry).

The American Audit Co. show a cost of construction, according to the books of the company, of $1,319,630.35 (p. 213; report of American Audit Co.). These items are all items of common and preferred stock issues in relation to various stations, excepting one of cash of $4,880.35. An analysis of these items by the Audit Co. shows actual direct cost of $643,000 (p. 214). But the Audit Co. comes to the conclusion that "the charge to construction account on the company's books is approximately $1,123,000" (p. 214).

COST OF DUPLICATION.

Mr. Alfred Brooks Fry, consulting engineer, employed by the joint commission, reported upon the cost of duplication of each of the systems. Upon the subject as a whole he said as follows:

> It has, of course, been necessary to consider the cost of duplicating the present systems; but to be forced to duplicate because of inability to purchase them at a fair price, if Government ownership be determined on, would involve waste of human accomplishment and of a large investment for the present tube systems, except perhaps part of the 10-inch line in Boston, would be next to useless to anyone save the United States Post Office Department. Besides the physical reconstruction in the heart of the business centers of great cities would be a matter of serious difficulty and cause much public inconvenience to populations who for years have suffered from previous lack of consistent policies and foresight in the conduct of municipal works so far as they relate to the reconstruction of streets and of the subways, pipes, ducts, and wires beneath them. Some photographs transmitted of street work in New York illustrate the difficulties referred to and the wisdom of avoiding needless disturbance of traffic, with accompanying risk to public health and welfare.
>
> I believe the estimates on cost of duplication are fair for each system; but it should be borne in mind that until bids are actually taken for special work of this description it is next to impossible to determine how contractors would look upon it. Work of this character heretofore put on the market has never attracted general competition.
>
> The installation of the pneumatic-tube line owned by the United States Treasury Department between the United States appraisers' warehouse and the United States customhouse, New York, N. Y., was thoroughly advertised in January, 1910, for a

considerable period, and tenders were solicited not only by customary advertisement and the posting of notices in public places, but also by letters, and yet but one bid was received, i. e., that of the New York Pneumatic Service Co.

If work of this kind along a route not unduly difficult failed to attract any competition when engineering contracting work in general in New York was rather dull, it would appear that this condition would be a factor that we must consider when contemplating duplication. (Pp. 282 and 283; report of Mr. Fry.)

Boston.—Mr. Fry estimated the probable cost of duplicating the present pneumatic-tube system in Boston at $426,762 (p. 275; report of Mr. Fry). The basis for this estimate is given in his report.

New York and Brooklyn.—Mr. Fry estimated the probable cost of duplicating the present pneumatic-tube system in New York and Brooklyn, including all power, generating, and station apparatus, at $2,363,439 (p. 254; report of Mr. Fry). The basis for this estimate is given in his report.

Chicago.—Mr. Fry estimated the probable cost of duplicating the present pneumatic-tube system in Chicago at $653,318.87 (p. 270; report of Mr. Fry). The basis for this estimate is given in his report. He states further that he would not recommend the reproduction of all the present lines because the service to the stations could be improved.

St. Louis.—Mr. Fry estimated the probable cost of duplicating the present pneumatic-tube system in St. Louis, including power and station apparatus, at $123,000 (p. 279; report of Mr. Fry). The basis for this estimate is given in his report.

Philadelphia.—Mr. Fry estimated the probable cost of duplicating the present pneumatic-tube system in Philadelphia, including all power, generating, and station apparatus, at $724,000 (p. 263; report of Mr. Fry). The basis for this estimate is given in his report.

These results as to construction and duplication are shown in the following table:

Cost of construction to December 31, 1912, and of duplication.

	Length.	Total cost claimed by companies.	Cash cost of construction, etc., as claimed by companies.	Cost of construction as reported by American Audit Co.	Estimated cost of duplication.	Estimated cost per mile of duplication.
	Miles.					
Boston	6.77	[1] $422,408.06	[1] $384,418.12	$380,238.12	$426,762.00	$62,704
New York and Brooklyn	26.52	[1] 6,527,046.45	[1] 5,511,645.38	3,244,648.30	2,363,439.00	87,151
Chicago	9.60	[1] 1,002,960.39	[1] 614,482.19	905,188.76	653,318.87	68,042
St. Louis	1.94	[1] 275,121.99	[1] 108,856.95	149,489.11	123,000.00	62,000
Total	44.83	8,227,536.89	6,619,402.64	4,679,564.29	3,566,519.87	....
Philadelphia	10.00	[1] 2,006,575.14	[2] 643,000.00	1,123,000.00	724,000.00	72,400
Total	54.83	10,234,112.03	7,262,402.64	5,802,564.29	4,290,519.87	....

[1] Reported by Mr. Fry.

[2] Reported by American Audit Co.

Since the testimony was submitted to the commission and the reports of the American Audit Co. and of Mr. Fry were made as to cost of construction, certain changes and extensions have been made in the tube systems in New York and Chicago which have resulted in additional expenditures for construction. Under date of June 15, 1914, the president of the American Pneumatic Service Co. submits the following statement:

> In reply to your letter of June 9 in which you ask for general items making up the amount of $142,102.14 expended for extensions and improvements as mentioned in our letter of May 27, 1914, we wish to say these general items are made up as follows:

CHICAGO.

Kinzie Station:		
Street work	$23, 605. 00	
Station work	732. 19	
Removal of old line	685. 72	
Engineering and miscellaneous expense	4, 755. 32	
		$29, 778. 23
Refrigerating plant		2, 529. 85

We can not without some little delay furnish general items for this. They will include motor, compressor, piping, wiring, foundations, and labor.

NEW YORK.

Extension to Pennsylvania terminal:		
Street work	$43, 369. 48	
Station work	22, 142. 18	
Engineering and miscellaneous expense	2, 076. 72	
	67, 588. 38	
Removal of old line (profit account material recovered)	3, 006. 18	
		64, 582. 20
Station I:		
Street work	15, 660. 03	
Station work	3, 885. 01	
Engineering and miscellaneous expense	444. 74	
		19, 989. 78
Station J:		
Street work	8, 897. 57	
Station work	1, 959. 12	
Removal of old line	1, 540. 96	
Engineering and miscellaneous expense	824. 43	
		13, 222. 08
Refrigerating plants		12, 000. 00

In relation to the item of $12,000 for refrigerating plants, we wish to say the total amount of our engineer's estimate for the work is $11,891.88. As installations of this character generally overrun the estimate, we consider that an even figure of $12,000 will fairly represent the value of this work when completed.

We have to date expended the following amounts in the installation of these plants, which include the foundations, electric wiring, etc.:

General post office	$1, 195. 40
Madison Square station	694. 94
Times Square station	583. 33
Station W	347. 35
	2, 821. 02

The machinery which will be installed to operate these plants, contract for which has already been let, will cost us about $7,000.

We think there is no doubt that the total amount to be expended on these plants complete will approximate $12,000.

Total	142, 102. 14

Depreciation.—Relative to the question of depreciation Mr. Alfred Brooks Fry, the consulting engineer, states as follows:

> As regards the element of depreciation, I am not disposed to give it much weight as a practical question in connection with the pneumatic tube companies' plants in the various cities (p. 257; report of Mr. Fry).

In regard to Philadelphia he makes similar report, stating that "the inspection of apparatus indicates that this element is insignificant, provided always repairs and maintenance are kept up" (p. 266; report of Mr. Fry).

Regarding Chicago, he says, commenting upon his assistant's report:

> I am, however, ready to stand behind the accuracy of his detailed statements, and believe that the depreciation which has been charged off against this plant for the past year—i. e., $38,370—will be required to put it in first-class operating condition. I therefore regard this item of depreciation a real thing, and not a more or less bookkeeping figure, to be considered as an offset against the theoretical taking over of the tubes beneath the streets by the city of Chicago on the expiration of the company's present franchises (p. 268; report of Mr. Fry).

Regarding Boston, he states that he does not regard depreciation as a factor worth consideration, but makes the same qualification regarding repairs and maintenance as in other cases (p. 277; report of Mr. Fry).

Regarding St. Louis he states substantially the same as in other cases (p. 280; report of Mr. Fry).

COST OF MAINTENANCE AND OPERATION.

In view of the developments and improvements made in the tubes and machinery during the past 20 years, which have resulted in the standardization of the equipment and should as a natural consequence reduce the cost of operation to the minimum, it is thought that the figures given by the American Audit Co. for the year ended March 31, 1912 (the last year reported), can be accepted as the cost of maintenance and operation. It will be observed in the following tables that there is considerable variation in the costs of operation, power, and general expenses in the different cities. It seems fair to assume that these variations are due to the difference in the volume of mail transmitted, in the price of power purchased, and in the length of tube lines, and the number of stations on the lines.

There appears to be a variation in the costs given for interest, taxes, and depreciation which is seemingly due to bond issues and the terms of franchises. No figures are given for depreciation in connection with the systems in Boston, New York, and St. Louis. It appears that all systems are operated at a profit except at Chicago, where the charge of depreciation on account of 20-year franchise figures largely.

Cost of maintenance and operation per annum for the year ended Mar. 31, 1912.

	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.
Operating expenses	$46,290.64	$234,565.00	$75,164.35	$16,529.53	$78,438.44
Insurance	595.32	1,381.84	443.83	119.54	76.99
Taxes	2,524.39	10,540.48	8,384.66	2,706.11	2,791.08
Depreciation	(1)	(1)	38,370.00	(1)	4,662.50
Interest	20,266.07	778.46	48,907.35	12,049.56	10,879.29
Bond premium	565.44	2,400.36	1,472.28	274.08	....
Total	70,241.86	249,666.14	172,742.47	31,678.82	96,848.30
Cost per mile	10,375.46	9,414.26	17,994.00	16,329.28	9,684.83
Ratio of total cost to pay of $17,000 per mile per annum (per cent)	61.03	55.38	[2] 5.85	96.05	56.97

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[1] Not given.

[2] Loss.

Cost of maintenance and operation per mile per annum for the year ended Mar. 31, 1912, excluding taxes, interest, depreciation, and bond premium.

	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.
Operation, including all repairs	$3,671.06	$3,887.90	$4,718.32	$3,954.35	$3,385.85
Power	2,549.80	4,071.40	2,394.36	3,345.70	3,919.30
General expenses	612.75	885.55	716.92	1,220.33	538.70
Total	6,833.61	8,844.85	7,829.60	8,520.38	7,843.85
Ratio of partial expenses to the total expenses:					
Operation, including all repairs (per cent)	53.72	43.96	60.27	46.41	43.17
Power (per cent)	37.32	46.03	30.58	39.27	49.96
General expenses (per cent)	8.96	10.01	9.15	14.32	6.87
Ratio of total operating expenses (including power and general expenses) to pay received of $17,000 per mile per annum (per cent)	40.19	52.03	46.05	50.12	46.14

The data in the above two tables are collated from the following sources:

Figures for ''operating expenses'' through ''bond premium'' from the report of the American Audit Co. Operating expenses for Boston, New York and Brooklyn, Chicago, and St. Louis, from Exhibit H, page 236. Insurance through bond premium: Boston from Exhibit D, page 223; New York and Brooklyn from Exhibit E, page 224; Chicago from Exhibit G, page 226; St. Louis from Exhibit H, page 227; Philadelphia, ''operating expenses'' through ''bond premium'' from Exhibit A, page 214.

The cost per mile and the ratio of cost are calculated from the total costs, and the mileages as given in the table ''Data concerning pneumatic-tubes companies,'' from the report of Mr. Fry, page 286.

VALUE OF PNEUMATIC-TUBE SYSTEMS TO THE GOVERNMENT.

The special advantages which are secured to the postal service by the operation of the pneumatic tubes for the transmission of mails are difficult to appraise in monetary value. It is estimated that the pneumatic tubes have superseded other classes of service which if substituted for them would cost the department approximately $362,000 a year. The difference between this cost and the annual cost of the tube service, represented either in the annual contract price paid the companies or in the cost to the Government of operation if the Government owned the tubes, must be considered in relation to the special advantages derived from that service. These special advantages have been referred to hereinbefore.

There are other advantages which would accrue to the department in case the Government owned and operated the tubes, such as the following:

The difficulties and expenses which corporations and companies have in securing franchises for the operation of service and permits for laying the tubes, and of raising capital for their construction, would not be encountered by the Government. The construction and operation of tubes at less cost by the Government would encourage the extension of the systems where at the present cost such extensions are impracticable and inadvisable. The necessity for meeting all expenses of changes in the tube lines would result in more economical administration in the matter of locating postal stations which are to be supplied from lines.

The utility and general advantage of the use of pneumatic tubes for mail transportation in cities has been approved and commended by all commissions that have considered the subject, whether composed wholly or in part by postal officials. Practical experience with the service appears to have justified the opinions so expressed. The estimated monetary value to the Government of the present pneumatic-tube systems is as follows:

The utility of the system in Boston, New York, and Brooklyn, and Philadelphia has been amply demonstrated by experience, and is sustained by the opinion of postal officials. Particularly is the system useful in New York City, where it covers the entire scheme of post office, postal stations, and railroad stations on Manhattan Island as far north as One hundred and twenty-fifth Street. The extent of tubes contracted for in Chicago was never fully installed because the changes in physical conditions in the city and the difficulty the company had in raising adequate funds to complete the system because of the peculiarity of the franchise. The service therefore has never been as useful in that city as in the ones above named. In St. Louis the system is quite limited, and no part of it is used above 30 per cent of the theoretic maximum capacity.

Mr. Fry estimates cost of duplication as $4,290,519.87 and the going value at $5,142,596.50 (pp. 255, 264, 270, 275). The minimum value of the present system to the Government is estimated at $5,078,560.21, being the estimate of Mr. Fry for all cities exclusive of Boston and St. Louis, where the estimate of the department is substituted. As to Boston, his estimate was revised by the Post Office Department, Mr. Fry having used $399,585.80 as the Audit Co.'s ledger construction account (p. 275), whereas this includes the cost of certain small tubes not used for mail service, the amount being $380,238.12 instead. For St. Louis Mr. Fry did not make an estimate, and this was made by the department (pp. 255, 264, 270). This is arrived at by the plan of the Interstate Commerce Commission, namely, by taking the cost of construction (in this case the one given by the American Audit Co. hereinbefore stated), the cost of reproduction (in this case the figures given by Mr. Fry in his report hereinbefore stated), and the going value as determined by the department for St. Louis, according to the method followed by Mr. Fry, and taking an average of the three. The maximum value is placed at $7,351,643.38, and is arrived at by the same process, except that the going value is determined according to the claims of the pneumatic-tube companies, namely, by deducting only the operating expenses from the gross revenue and capitalizing the result at 4 per cent. Mr. Fry's finding as to maximum value for Philadelphia system has been revised by the Post Office Department for the reason that he took the tube company's total claim of cost for his first element instead of the Audit Co.'s finding of cost, namely, $1,123,000. This reduces Mr. Fry's result to $1,378,665.50. The table following shows the figures referred to in a more convenient form.

Estimated maximum and minimum value of present systems to the Government (Mar. 31, 1912).

	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.	Total.
American Audit Co.'s ledger cost account[1]	$380,238.12	$3,244,648.30	$905,188.76	$149,489.11	$1,123,000.00	$5,802,564.29
Tube companies claimed total cost[2]	422,408.06	6,527,046.45	1,002,960.39	275,121.99	2,006,575.14	10,234,112.03
Estimated cost of duplication, from the report of Mr. Fry[3]	426,762.00	2,363,439.00	653,318.87	123,000.00	724,000.00	4,290,519.87
Going value according to Mr. Fry[4]	1,110,024.75	1,551,838.00	616,691.75	35,292.00	1,828,750.00	5,142,596.50
Going value as the tube companies claim it[5]	1,721,709.00	5,384,075.00	2,153,041.25	414,024.25	2,288,996.50	11,961,846.00
Maximum value of the present system to the Government on the basis of the Interstate Commerce Commission as applied by the tube companies[5]	842,903.04	3,664,054.10	1,237,182.96	228,837.78	1,378,665.50	7,351,643.38
Minimum value of the present system to the Government on the basis of the Interstate Commerce Commission, as applied by Mr. Fry[4]	639,008.29	2,386,641.76	725,066.46	102,593.70	1,225,250.00	5,078,560.21

[1] Pp. 237, 238, Boston; pp. 237, 238, 239, New York and Brooklyn; pp. 237, 239, 240, Chicago; pp. 237, 240, St. Louis; p. 214, Philadelphia.

[2] P. 275, Boston; p. 253, New York and Brooklyn; p. 270, Chicago; p. 278, St. Louis; p. 264, Philadelphia.

[3] P. 275, Boston; p. 254, New York and Brooklyn; p. 270, Chicago; p. 279, St. Louis; p. 263, Philadelphia.

[4] P. 275, Boston; p. 255, New York and Brooklyn; p. 270, Chicago; St. Louis computed by department; p. 264, Philadelphia.

[5] P. 276, Boston; p. 255, New York and Brooklyn; p. 271, Chicago; St. Louis computed by department; p. 264, Philadelphia.

OFFERS OF SALE.

The American Pneumatic Service Co., controlling the subsidiary companies operating service in New York, Brooklyn, Boston, Chicago, and St. Louis, submitted to the joint commission an offer of sale, the terms of which are set forth in Appendix B.

The Pneumatic Transit Co., operating the service in Philadelphia, Pa., submitted to the joint commission an offer of sale, the terms of which are set forth in Appendix C.

ESTIMATED COST OF OPERATION UNDER GOVERNMENT OWNERSHIP.

The testimony and reports submitted to the joint commission enable a comparison to be made between the cost of operation of the tube service by the companies and the probable cost of such operation by the Government. The estimates of cost give consideration to the probable increase for labor on account of shorter hours, repairs, and to reductions in general expenses, such as salaries, rent, light, heat, legal, and travel expenses. The following table shows the total estimates for each city for service performed by the tube companies and for the same performed by the Government:

Table showing the operating expenses of the tube companies, and the estimated operating expenses of the Government.

	General expenses.		Operating expenses, including repairs.	
	Present cost to tube companies.	Estimated cost to Government.	Present cost to tube companies.	Estimated cost to Government.
New York and Brooklyn	$23,484.66	$9,000.00	$103,106.98	$119,000.00
Philadelphia	5,386.89	1,200.00	33,858.53	43,300.00
Chicago	16,201.14	1,500.00	37,790.53	49,921.00
Boston	4,150.60	4,103.00	24,876.75	32,645.00
St. Louis	6,353.56	500.00	12,814.02	18,005.00

	Power.		Total operating expenses.	
	Present cost to tube companies.	Estimated cost to Government.	Present cost to tube companies.	Estimated cost to Government.
New York and Brooklyn	$107,973.36	$104,000.00	$234,565.00	$232,000.00
Philadelphia	39,193.02	39,193.02	78,438.44	83,693.02
Chicago	25,231.84	20,184.00	79,223.51	71,605.00
Boston	17,272.29	15,545.00	46,290.64	52,293.00
St. Louis	4,952.76	4,500.00	24,120.34	23,005.00
Total operating expenses for year ended Mar. 31, 1912			462,637.93	462,596.02

The figures for the expenses of the tube companies are from the report of the American Audit Co. to the commission of February 21, 1913. The estimated expenses to the Government are by Mr. Fry, and are taken from his report to the commission of March 10, 1913.

The following table shows estimates of the annual savings which would result in the operation by the Government under its ownership of the system in each city and for all systems together. The table shows, first, the estimated gross saving for each city and for all combined based upon a comparison of the present contract price and the estimated cost to the Government if owned and operated by the department; second, the estimated net saving for each city and for all combined computed upon the basis of purchase at the cost price of the ledger construction cost reported by the American Audit Co., plus 9 per cent for value of intangible property (the plan adopted by the public service commission of the first district of New York), and a computation of interest thereon at 2½ per cent; third, the estimated net saving for each city and for all combined computed upon the basis of the maximum value of the tubes by the Interstate Commerce Commission plan, and a computation of interest thereon at 2½ per cent; and, fourth, the estimated net saving for each city and for all combined computed upon the basis of the minimum value of the tubes by the Interstate Commerce Commission plan, and a computation of interest thereon at 2½ per cent. The table also shows in each case of estimated net saving the number of years which would be required to repay the purchase price by the application of the annual savings.

Table showing estimated gross and net savings under Government ownsership, and number of years required to repay purchase price by the appreciation of the annual savings.

	New York and Brooklyn.	Philadelphia.	Chicago.	Boston.	St. Louis.	Total.
Mileage Mar. 10, 1913	26.5230	9.999	9.6017	6.774	1.9465	54.8442
Present annual rental	$449,928.00	$169,998.30	$161,286.00	$115,158.00	$33,090.00	$929,460.30
Estimated cost under Government ownership and operation	$232,000.00	$83,693.02	$71,605.00	$52,293.00	$23,005.00	$462,596.02
Gross saving under Government ownship and operation	$217,928.00	$86,305.28	$89,681.00	$62,865.00	$10,085.00	$466,864.28
Ledger construction cost by American Audit Co	$3,244,648.30	$1,123,000.00	$905,188.76	$380,238.12	$149,489.11	$5,802,564.29
Intangible property at 9 per cent	$292,018.34	$101,070.00	$81,466.99	$34,221.43	$13,454.02	$522,230.78
Assumed purchase price	$3,536,666.64	$1,224,070.00	$986,655.75	$414,459.55	$162,943.13	$6,324,795.07
Interest at 2½ per cent	$88,416.00	$30,601.75	$24,666.39	$10,361.49	$4,073.58	$158,119.21
Net saving to the Government	$129,512.00	$55,703.53	$65,014.61	$52,503.51	$6,011.42	$308,745.07
Years required to pay for tubes by applying net savings (including interest)						16.85
Years required to pay for tubes by applying net savings (excluding interest)						13.55
Maximum value of the tubes by Interstate Commerce Commission plan	$3,664,054.10	$1,378,665.50	$1,237,182.96	$842,903.04	$228,837.78	$7,351,643.38
Interest at 2½ per cent	$91,601.35	$34,466.64	$30,929.57	$21,072.58	$5,720.95	$183,791.09
Net saving to the Government	$126,326.65	$51,838.64	$58,751.43	$41,792.42	$4,364.05	$283,073.19
Years required to pay for tubes by applying net savings (including interest)						20.36
Years required to pay for tubes by applying net savings (excluding interest)						15.75
Minimum value of the tubes by Interstate Commerce Commission plan	$2,386,641.76	$1,225,250.00	$725,066.46	$639,008.29	$102,593.70	$5,078,560.21
Interest at 2½ per cent	$59,666.04	$30,631.25	$18,126.66	$15,975.21	$2,564.84	$126,964.00
Net saving to the Government	$158,261.96	$55,674.03	$71,554.34	$46,889.79	$7,520.16	$339,900.28
Years required to pay for tubes by applying net savings (including interest)						12.95
Years required to pay for tubes by applying net savings (excluding interest)						10.87

EXTENSION OF TUBES UNDER GOVERNMENT OWNERSHIP.

The development and growth of the larger cities will make it desirable to extend the present tube systems and possibly to install pneumatic tubes in other cities. There should be no difficulty in letting contracts for such extensions.

It is thought that the Government could readily obtain any necessary franchises to construct tubes or to extend the present systems in all cities.

LARGER TUBES OR TUNNELS TO CONVEY ALL THE MAILS.

During recent years there has been some contention that there should be installed larger tubes or tunnels capable of transporting all the mails, particularly between post offices and important railroad depots. The introduction of parcel post has accentuated to some extent this contention. The principal reasons advanced for the use of larger tubes are the provision of a faster means of transportation, free from outside interference and available at all times for the transmission of mail in pouches and sacks without breaking bulk, to avoid delays to the mails on account of congestion in the streets, and to contribute to the relief of crowded avenues of traffic by the elimination of mail wagons and automobiles.

Congress, in an act approved March 4, 1911, authorized the Postmaster General to advertise for the construction of double lines of pneumatic tubes, 30 inches in diameter and not exceeding 1 mile in length, in the city of Cincinnati, Ohio, and to enter into contract for the operation of the same for the transmission of the mails, at a rate not exceeding $17,000 per mile per annum, until June 30, 1913, provided that no contract should be entered into until the proposed lines should have been operated for mail purposes in a satisfactory manner for six months without cost to the Government.

A proposal was made by the Universal Pneumatic Transmission Co., of Chicago, Ill., for a line 0.79 mile in length between the post office and the Central Union Station, at the maximum rate which was accepted by the Post Office Department. The company, after twice securing an extension of time for the commencement of service, failed to construct the tubes.

Considerable interest has been manifested in the question of constructing large tubes in New York City by individuals and tube companies, which culminated in the appointment by the Postmaster General of a commission of postal officials on October 24, 1912, to investigate and report on the advisability of the establishment of mail service between the Grand Central Station and Pennsylvania Terminal in New York City by a pneumatic or electric tube system.

It is learned that the Post Office commission received tentative propositions from four companies for the construction and equipment of large tubes between the two points named at prices ranging from $425,000 to $650,000. One of the companies proposed to construct a tube 9 feet wide by 6 feet deep to accommodate double tracks, and also provide space for smaller tubes for the transmission of first-class mails if desired. The cars would be nearly 9 feet in length and designed to carry several pouches or sacks of mail. Another company proposed to construct a system of double tubes 30 inches in diameter, and another proposed similar tubes 36 inches in diameter, the cars to accommodate from one to two pouches or sacks. Each of these systems was to be operated by electric power. Another company proposed to construct a system of double or single tubes 24 inches in diameter for the operation of cylindrical cars that would carry one pouch or sack at a time and be propelled by the vacuum process.

Only one of these companies expressed a willingness to construct large tubes and operate them under contract. They proposed to transmit the mails on a ton-mile basis at a rate not to exceed 10 per cent above the cost of the automobile service between the two points named, the weights to be secured at the time of dispatch or on the basis of annual weighings during representative periods. The company proposed to use the tubes for commercial business, but would give the mails absolute right of way.

The distance between the Grand Central Station and the new post office is slightly over 1½ miles. It will readily be seen that the cost of construction and equipment of a double-tube system would run from $300,000 to $420,000 per mile, according to the system selected. The high cost of construction is due mostly to subsurface conditions in New York City and the difficulties to be overcome in entering post-office buildings with tubes of large diameter.

There is so much under street construction in New York City that any additional pipe lines or tunnels would have to follow a low level, particularly at street intersections, where the subways would be encountered. At present there are subways under Fourth and Sixth Avenues south of Forty-second Street, another subway is being constructed under Broadway, and yet another is soon to be installed under Seventh Avenue. This makes four subways that would have to be crossed.

It is generally conceded that on account of the structural work of the Grand Central Depot and sunken-track levels, and the subway construction under Forty-second Street and Lexington Avenue, it would be very difficult to approach the Grand Central Station except at a very low level. This would necessitate the use of lifts and mail chutes, which would add considerably to the cost of construction and operation of the proposed tubes and require more time and labor in the handling of the mails.

Engineers who have made a study of the situation state that it is very difficult to induce contractors to take up work of this kind except at a very high figure, due to the conditions incident to such undertakings and the heavy damage risks they would have to assume.

It is evident that any underground system for the transportation of the mails in bulk can only be secured at great cost. It is not our duty under the authority given this joint commission to determine whether the cost would be justified either by the advantages offered over the present means of service or the volume of mails to be transported.

There is a daily average of about 12,000 pouches and sacks conveyed between the Grand Central and Pennsylvania Stations in both directions. The weight of the mails exceeds 300 tons daily. It has been found that at certain times of the day tubes as proposed would not have sufficient capacity to move all of the mails, and consequently other means of transportation would have to be employed.

It is estimated that the time in transit by tube would be from four to seven minutes, and about three minutes more would be consumed in loading and unloading. If elevators and chutes are used, more time would be required. An automobile capable of carrying from 60 to 80 pouches and sacks will cover the distance in 10 minutes, although the running time allowed at present during part of the day is 12 minutes, and consume about eight minutes more in loading and unloading.

A further feature which must be seriously considered in connection with any large tube system is the provision which must be made to handle at terminals and stations carriers as large as 30 inches in diameter or larger. In order to do this, provision must be made for space and tracks like a miniature railroad yard. A yard with curves in it would be out of question, as the limiting curve for a 24-inch carrier is 50 feet, and the limiting curve for a 30-inch tube would be still larger. On page 105 reference is made to a plan of a yard that will accommodate eighty 24-inch carriers, designed by D. H. Burnham & Co. for the new Washington post office. A plan constructed upon this need shows that so much space would be taken up that it would be impracticable to install on the distribution floor of a post office.

An inquiry was made of the postmasters of the cities in which tube service is now in operation as to their opinion regarding the justification for larger tubes. The postmaster at New York reported that larger tubes would be justified between Grand Central and Pennsylvania Stations and between the Pennsylvania Station and New York general post office. The postmaster at Brooklyn reported that there would be no justification for larger tubes between points in that city. The postmaster at Boston reported that there would be no justification for larger tubes between points in that city. The postmaster at Philadelphia reported that there would be no justification for larger tubes between points in that city. The postmaster at Chicago reported that if the department decided such tubes to be practical and the cost of installation and operation would not be unreasonably greater than the cost of screen wagon or automobile service their installation would be justified. The postmaster at St. Louis reported that larger tubes would be a material benefit between the general post office and Central Station and between Central Station and Bridge Station. In this connection it will be noted from the table of per cent of use hereinbefore given, that the maximum use of the present tube in St. Louis is only between 20 and 30 per cent and the minimum use between 4.5 and 10 per cent of tube efficiency.

The authority conferred upon this joint commission does not extend to the question of the purchase and operation of pneumatic tubes other than those in operation and the extension of such systems. It has been deemed proper, however, to refer to the question of larger tubes and their desirability or undesirability because of the contentions made that the existing tubes should be superseded by larger ones. The joint commission heard all the testimony which was offered upon this question and is of the opinion that the utility of the present 8-inch tubes is not affected by the question of the desirability of larger tubes under certain conditions when the cost of construction and operation of the same is taken into consideration.

CONCLUSIONS.

In view of the testimony and reports submitted and set forth in the hearings before the Joint Commission to Investigate the Pneumatic Tube Postal System, and the foregoing recited facts, we reach the following conclusions:

The pneumatic-tube service for the transmission of mails in the cities in which such service is now installed is a valuable adjunct to the mail transportation service for handling first-class, registered, and special-delivery mails not furnished by other means of transportation, and is justified by the advantages of availability, expedition, security, and reliability.

The Postal Service and the patrons of the mails have become adjusted to this mail facility through use during the contract periods, and its considerable withdrawal or discontinuance would be regarded as an inadvisable curtailment of facilities. The present contracts expire June 30, 1916.

The tubes as now used have been for the most part laid under contracts with the Government solely for postal purposes and if the mail service by them were discontinued there is little use to which they could be put for commercial purposes, and that only by extensive changes of terminals and relocation of supplemental lines and the terminal machinery.

Under Government ownership and operation of the tubes and equipment important advantages would accrue. The necessity for financing an enterprise attended with a certain amount of risk with the consequent cost for the hazard—ultimately paid by the Government in the contract price of service—would be obviated. Difficulties in obtaining franchises would not exist. Extensions of lines where justified would be possible at reduced cost and depending only upon the judgment of the officers of the Post Office Department and the action of Congress. The location of postal stations and the maintenance or construction of tube lines to supply them would be coordinated, thus resulting in fewer changes in line locations and abandonment of constructed lines and consequent loss. The Government would maintain and operate the tubes at an annual cost much less than it is paying under contracts for the service because it would be relieved of interest at commercial rates on bonded debts, insurance charges, taxes, dividends on stock or return on investment, and certain other expenses, such as salaries, rent, light, heat, and legal services, now obligations upon the contracting companies. The contract cost of the service for the fiscal year 1912 was $929,460.30. It is estimated that under Government ownership and operation the cost would be approximately $462,596.02 per annum, a saving of $466,864.28 per annum, which would repay the first cost in 10.87 years if purchase be made at the estimated minimum value of $5,078,560.21. If 2½ per cent be allowed upon such purchase value the first cost would be repaid in about 12.95 years.

In view of the facts, we are of the opinion that it is feasible and desirable for the Government to purchase and operate the equipment for pneumatic-tube service in the cities in which such service is now installed, together with rights to operate and extend equipment in such cities and elsewhere, such purchase and operation to become effective from the date of the termination of the present contracts for service.

We recommend that authority be given the Postmaster General to negotiate with the pneumatic-tube companies concerned for the purchase of the pneumatic tubes and all appurtenances, rights, and equipment connected therewith in operation under contract for mail service in the cities in which such service is now installed, together with patent rights to operate and extend tubes and equipment in such cities and elsewhere, and to purchase the same in whole or in such part as may be represented by the service in any one or more of the cities concerned, at such amount or amounts as may be reasonable and just, and that such purchase shall be approved by the two Committees on Post Offices and Post Roads of the Senate and House of Representatives before the same shall be made.

HOKE SMITH,
Chairman.
JOSEPH STEWART.

OCTOBER 23, 1914.

Mr. Blackmon, of Alabama, one of the members of the Pneumatic Tube Commission appointed under the authority conferred on the chairman of the Committee on Post Office and Post Roads of the House of Representatives, approved August 24, 1912, submits the following as his conclusions as derived from the testimony, hearings, and investigations of the pneumatic-tube system which is now being leased by the Federal Government and operated in the cities of New York, Philadelphia, Boston, Chicago, and St. Louis:

I agree that the testimony taken and the figures submitted by the engineers and auditors employed by the commission are correctly reported in the report, but I can not agree to recommend to Congress a purchase of these tubes. My reasons are these:

First. I do not believe that the Government can operate a pneumatic-tube system as cheaply as can private individuals.

Secondly. I am not convinced that there exists a necessity for the operation of fifty-odd miles of 8-inch pneumatic tubes.

Third. If the necessity exists for the use of pneumatic tubes, the present tubes have not the capacity to keep pace with the increase in mail matter that is bound to come from a perfection of our parcel-post system.

Fourth. A careful examination of all the testimony and facts submitted leads me to believe that the Government can take care of this class of mail by contract, using screen wagons and automobiles, more cheaply than it can be handled by any system of pneumatic tubes.

I am not prepared to say that the $17,000 per mile paid for the service now being handled by the use of the pneumatic-tube system is excessive, but I am convinced that there is not sufficient mail handled through these tubes to warrant the Government in paying $17,000 per mile for the service.

In view of the foregoing conclusions reached by me, I can not join in recommending to Congress a purchase of these tubes.

Respectfully submitted.

FRED L. BLACKMON.

APPENDIXES.

APPENDIX A.

History of Pneumatic-Tube Mail Service, 1892-1914.[1]

The use of pneumatic tubes in the United States Postal Service for the general transmission of first-class mail is believed to be the first general use of large tubes for mail purposes. In foreign countries pneumatic tubes of small diameters (say 2½ to 3 inches) had been used for the transmission of telegrams, and in some instances for the transmission of special-delivery letters or cards. In the United States there were also some instances in commercial business of the use of pneumatic tubes of similar dimensions for like purposes and for comparatively short distances. The first installation of a large tube for postal purposes was made in 1893 in Philadelphia, Pa., this being a 6-inch tube, and it is said that the problems connected with its operation were entirely different from those presented in the use of the tubes of smaller diameter. This 6-inch tube was in operation for about four years before the installation of 8-inch tubes. There has been a constant employment of inventive ingenuity during the past 15 years to improve the mechanical operation of these larger systems. The chronology of the development of the pneumatic-tube mail service is briefly given as follows:

1892.

In the annual report of Postmaster General Wanamaker he stated that he was able to secure an item of $10,000 in the last appropriation bill for experiments with pneumatic tubes, and that in response to advertisements eight proposals were received, of which, however, only one proved practicable for immediately testing the tubes for service; that the Pneumatic Transit Co. of New Jersey was already putting down tubes in Philadelphia between the general post office and the East Chestnut Street Postal Station, to be completed soon after December 1, 1892, and that he was informed that the company had incurred an expense of $25,000. He stated further that the Post Office Department could try the system for one year without expense and then rent, purchase, or reject it without incurring any liability.

1893.

On March 1 the use of the Philadelphia 6-inch tube, as above described, for the transmission of mail experimentally, commenced.

1894.

On March 1 the Post Office Department commenced paying for the use of the Philadelphia tube, the terminus of which had been removed from the East Chestnut Street Station to the Bourse Building; total distance, 0.55 mile; annual pay, $4,000. This was reduced, commencing March 1, 1895, to $3,450 per annum.

1895.

In his annual report the Second Assistant Postmaster General stated that it might soon be feasible to install an experimental tube or mechanical appliance between the New York general post office and the Forty-second Street Depot and between New York and Brooklyn.

1896.

The appropriation bill for fiscal year ended June 30, 1897, in the allowance for "Mail messenger service," provided that a sum not exceeding $35,000 might be used for the transportation of mails by pneumatic tubes or other similar device.

In his report for that year the Second Assistant Postmaster General stated that 24-inch or 36-inch tubes are not practicable on account of construction difficulties and expense, but that a 10-inch tube with 8-inch carriers would relieve the department of 65 to 70 per cent of trips now made by wagons. He stated that prospects seemed favorable for contracts in New York, Philadelphia, and Boston, and that it was possible that a proposition might be received from New York City for pneumatic-tube service over almost the entire island, in which event he would ask that Congress change the amount of money paid for regulation wagon service in New York City to the pneumatic-tube fund, "as the establishment of the tube service would practically do away with wagon service in New York City." He recommended that $50,000 be appropriated.

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[1] Compiled from the report of the "Investigations as to Pneumatic-Tube Service for the Mails" (Washington, 1909, H. Doc. No. 1220, 60th Cong., 2d sess.) and Post Office Department records.

1897.

The appropriation bill for the year ended June 30, 1898, permitted the expenditure of $150,000 (out of mail-messenger fund) for transportation of mail by pneumatic tube or other similar device. In pursuance of this, contracts were made for service in Philadelphia, Brooklyn, New York, and Boston, by 8-inch tubes, carriers to be 6⅞ by 21 inches.

Tube service began under this arrangement October 15, between the general post office and Station P, New York, N. Y., 0.7 mile; December 20, between the general post office and North Union Station, Boston, Mass., 0.74 mile; February 26, 1898, between the general post office and Station P, New York, N. Y., 0.7 mile; March 10, 1898, contract was made for the renewal of service by the 6-inch tubes; between the general post office and the Bourse Station, Philadelphia, Pa., 0.52 mile, at $17,600 per annum; April 7, 1898, tube service began between the general post office and Broad Street Station, Philadelphia, Pa., 0.94 mile, at $16,966 per annum; August 1, 1898, tube service began between the general post office, New York, N. Y., and the general post office, Brooklyn, N. Y., 1.65 miles.

1898-1902.

The following table shows the service in operation August 1, 1898:

Pneumatic-tube service in operation Aug. 1, 1898.

City.	Termini.	Length.	Annual rate.	Rate per mile.
		Miles.		
Boston, Mass.	General post office to North Union Station	0.74	[1] $17,055.00	$23,047
New York, N. Y.	New York general post office to Brooklyn general post office.	1.65	[2] 20,200.00	12,242
	General post office to Station P	4.20	[3] 176,099.70	41,928
	General post office to Station D, Madison Square, and F to H.			
Philadelphia, Pa.	General post office to Bourse Station	.52	[4] 17,965.00	34,548
	General post office via Reading terminal to Broad Street Station.	.94	16,966.00	18,048
Total.		8.05	248,285.70	30,842

[1] Includes steam power, $8,055.
[2] Includes labor, $6,200.
[3] Includes labor, $10,000; steam power, $15,044.70; and 2 engineers, $2,555.
[4] Includes steam power.

The Post Office appropriation bill for the year ended June 30, 1899, prohibited any new contracts for pneumatic-tube service. (This prohibition continued until June 30, 1901.)

The following table shows the service in operation during the years 1899, 1900, and 1901:

Pneumatic-tube service in operation June 30, 1899, 1900, and 1901.

City.	Termini.	Length.	Annual rate.	Rate per mile.
		Miles.		
Boston, Mass.	General post office to North Union Station	0.74	$9,000	$12,162
New York, N. Y.	New York general post office to Brooklyn general post office.	1.65	[1] 20,200	12,242
	General post office to Station P	4.20	[2] 158,500	37,738
	General post office to Station D, Madison Square, and F to H.			
Philadelphia, Pa.	General post office to Bourse Station	.52	17,600	33,846
	General post office via Reading terminal to Broad Street Station.	.94	16,966	18,048
Total.		8.05	222,266	27,610

[1] Includes $6,200 for labor.
[2] Includes $10,000 for labor.

Congress omitted to make any appropriation for pneumatic-tube service for the fiscal year ended June 30, 1902, hence all of this service was discontinued and the tubes were not operated from July 1, 1901, to June 30, 1902, inclusive. In lieu of an appropriation Congress directed an investigation by the Postmaster General as to the cost of construction and operation and the utility of a system of pneumatic tubes, etc., to enable Congress to determine whether to own, lease, extend, or discontinue the same.

RECOMMENDATIONS BY COMMITTEE OF EXPERTS, 1901.

On January 4, 1901, the Postmaster General made a report to Congress, as directed, giving results of an investigation of the pneumatic-tube service by local postal officials, this being revised by a general committee of postal officials, and this finally passed upon by a commission of seven experts outside the Postal Service, representative men of high commercial and engineering ability. The final committee of experts presented a number of conclusions, among which the following are the most important:

1. They found the new method of mail transportation to be a valuable and mechanically successful system, practically adapted in an admirable manner to the purposes of the Post Office Department and of great advantage to the business interests of the country in facilitating mail transmission.
2. They believed that the cost of pneumatic service could be reduced somewhat, and very considerably reduced with the further progress of improvement.
3. They declared that ownership by the Government is considered desirable whenever the systems adopted have passed the experimental stage.
4. As regards renewing contracts or making new contracts, they suggested that an option of later acquirement be included, and that such acquirement be by appraisal by experts of all property and all patent rights applicable to the contract or at a stated figure.
5. They advised the retention of all previously established pneumatic-tube service in Boston, New York (including the New York and Brooklyn line), and Philadelphia, 8.05 miles; and they recommend the following additional mileage:

	Miles.
New York City	18.00
Chicago	8.78
Philadelphia	6.19
Boston	.70
St. Louis	3.16
Total	36.83

This making a total of both old and new service of about 44.88 miles.

LAW OF APRIL 21, 1902.

The Post Office appropriation bill approved April 21, 1902, for the year ended June 30, 1903, contained the following provision:

"For the transmission of mail by pneumatic tubes or other similar devices, $500,000, or so much thereof as may be necessary; and the Postmaster General is hereby authorized to enter into contracts for a period not exceeding four years, after public advertisement once a week for a period of six consecutive weeks in not less than five newspapers, one of which shall be published in each city where the service is to be performed. That the contracts for this service shall be subject to the provisions of the postal laws and regulations relating to the letting of mail contracts, except as herein otherwise provided, and that no advertisement shall issue until after a careful investigation shall have been made as to the needs and practicability of such service and until a favorable report, in writing, shall have been submitted to the Postmaster General by a commission of not less than three expert postal officials, to be named by him; nor shall such advertisement issue until in the judgment of the Postmaster General the needs of the Postal Service are such as to justify the expenditure involved. Advertisements shall state in general terms only the requirements of the service and in form best calculated to invite competitive bidding.

"That the Postmaster General shall have the right to reject any and all bids; that no contract shall be awarded except to the lowest responsible bidder tendering full and sufficient guaranties, to the satisfaction of the Postmaster General, of his ability to perform satisfactory service, and such guaranties shall include an approved bond in double the amount of the bid.

"That no contract shall be entered into in any city for the character of mail service herein provided which will create an aggregate annual rate of expenditure, including necessary power and labor to operate the tubes and all other expenses of such service, in excess of 4 per cent of the gross postal revenues of said city for the last preceding fiscal year.

"That no contract shall be made in any city providing for 3 miles or more of double lines of tube which shall involve an expenditure in excess of $17,000 per mile per annum, and said compensation shall cover power, labor, and all operating expenses.

"That the Postmaster General shall not, prior to June 30, 1904, enter into contracts under the provisions of this act involving an annual expenditure in the aggregate in excess of $800,000; and thereafter only such contracts shall be made as may from time to time be provided for in the annual appropriation act for the Postal Service; and all provisions of law contrary to those herein contained are repealed."

Under this act contracts were made for service covering mileage of double lines of tubes in cities as follows:

	Miles.
Boston	5.44
New York	24.653
Philadelphia	7.642
Chicago	8.70
St. Louis	3.16
Total	49.595

1903.

During this fiscal year pneumatic-tube service was resumed in Boston, New York, and Philadelphia (8.05 miles), and extended so that on June 30, 1903, there was an aggregate in the three cities in operation of 12.495 miles.

1904.

Congress in the Post Office appropriation bill approved March 3, 1903, for the fiscal year ended June 30, 1904, appropriated "for transmission of mail by pneumatic tubes or other similar devices, $800,000."

1905.

RECOMMENDATIONS OF COMMITTEE OF 1905.

Congress, in Post Office appropriation bill approved April 23, 1904, for the fiscal year ended June 30, 1905, appropriated "For transmission of mail by pneumatic tubes or other similar devices, $500,000, from which sum may be paid amount necessary to fulfill the existing contract for service in Boston."

Under date of October 4, 1905, a commission of three expert postal officials, appointed by Postmaster General's order of November 15, 1904, to carefully investigate the needs and advisability of extending the pneumatic-tube service, submitted a report with the following recommendations for additional mileage:

City.	In operation Oct. 1, 1905.	Additional recommended.	Total.
	Miles.	*Miles.*	*Miles.*
Baltimore, Md		2.06	2.06
Boston, Mass	6.89		6.89
Brooklyn, N. Y		3.94	3.94
Chicago, Ill	8.88	8.814	17.694
Cincinnati, Ohio		2.29	2.29
Kansas City, Mo		2.28	2.28
New York, N. Y	6.853	18.61	25.463
Philadelphia, Pa	1.382	6.242	7.624
Pittsburgh, Pa		1.9	1.9
St. Louis, Mo	2.09	1.25	3.34
San Francisco, Cal		1.62	1.62
Total	26.095	49.006	75.101

1906.

Congress, in Post Office appropriation bill approved March 3, 1905, for the fiscal year ended June 30, 1906, appropriated "For transmission of mail by pneumatic tubes or other similar devices, $500,000."

1907.

Congress, in Post Office appropriation bill approved June 26, 1906, for the fiscal year ended June 30, 1907, appropriated "For the transmission of mail by pneumatic tubes or other similar devices, $900,000," and provided further, as follows: "And the Postmaster General is hereby authorized to enter into contracts not exceeding in the aggregate $1.250,000 under the provisions of law for a period not exceeding 10 years: *Provided*, That said service shall not be extended in any cities other than those in which the service is now under contract under authority of Congress, except the Borough of Brooklyn of the city of New York, and the cities of Baltimore, Md., Cincinnati, Ohio, Kansas City, Mo., Pittsburgh, Pa., and San Francisco, Cal."

1908.

Congress, in Post Office appropriation bill approved March 2, 1907, for the fiscal year ended June 30, 1908, appropriated "For the transmission of mail by pneumatic tubes or other similar devices, $1,250,000," and further provided, as follows: "And the Postmaster General is hereby authorized to enter into contracts not exceeding in the aggregate $1,388,759 under the provisions of the law for a period not exceeding 10 years: *Provided*, That said service shall not be extended in any cities other than those in which the service is now under contract under the authority of Congress, except the Borough of Brooklyn of the city of New York, and the cities of Baltimore, Md., Cincinnati, Ohio., Kansas City, Mo., Pittsburgh, Pa., and San Francisco, Cal."

Extensions were made during the year, as follows:

	Miles.
Brooklyn, Aug. 14, general post office to Station L	1.35
New York:	
July 15, Station O to Station E	1.1704
Sept. 21, Station E to Times Square	1.1739
Oct. 3, Times Square to Station G	1.1719
Nov. 6, Station G to Station N	1.4351
Nov. 6, Station N to Station W	.9635
Nov. 6, Station W to Station J	2.6174
Nov. 6, Station J to Station L	.9522
Nov. 9, general post office to Hudson Terminal	.4214

Totals for 1908: Length, 42.5896 miles; pay per annum, $724,023; rate per mile, $17,000.

MILEAGE CONTRACTED FOR AND UNDER OPERATION NOVEMBER 10, 1908.

The appropriation for the fiscal year 1909 was $1,000,000, and contracts were permitted for a total of $1,388,759. The service in operation November 10, 1908, represented an approximate annual rate of $724,028. The service contracted for represented an annual rate of about $1,089,171.09. The details are shown approximately in the following table:

City.	Contractor.	Total service contracted for.		Total service in operation Nov. 10, 1908.		Yet to be built.
		Length.	Annual pay.	Length.	Annual pay.	
		Miles.		*Miles.*		*Miles.*
Boston	Boston Pneumatic Transit Co.	6.652	$113,089.14	6.652	$113,089.14	....
New York	New York Pneumatic Service Co.	27.31	464,270.00	19.3056	328,195.20	8.0044
Brooklyn	do	1.35	22,950.00	1.35	22,950.00	....
Philadelphia	Pneumatic Transit Co.	8.21	139,570.00	6.022	102,374.00	2.188
Chicago	Chicago Postal Pneumatic Tube Co.	17.563	294,470.80	7.41	125,970.00	10.153
St. Louis	St. Louis Pneumatic Tube Co.	3.47	54,821.15	1.85	31,450.00	1.62
Total		64.555	1,089,171.09	42.5896	724,028.34	21.9654

Although Congress authorized contracts for tube service in Baltimore, Md., Cincinnati, Ohio, Kansas City, Mo., Pittsburgh, Pa., and San Francisco, Cal., no proposals were received by the department for service in those cities in response to the advertisement.

In the city of Philadelphia, although the mileage contracted for, as recognized by orders issued by the department, was 7.35, there was an additional extension between Southwark Station and Station D, 0.8637 mile, which, with the line between the general post office and Southwark Station already in operation, made the total mileage contracted for 8.2137. In addition to this another extension was recommended by a committee of three postal experts in July, 1908, from Station O via Fairhill Station to North Philadelphia Postal Station, a distance of about 1.72 miles.

In the city of Chicago the mileage not yet built (10.153) included the line out of use between the general post office and Kinzie Station (1.77 miles).

The act of Congress approved May 27, 1908, making appropriations for the service of the Post Office Department, etc., provided as follows:

"And the Postmaster General is hereby authorized and directed to investigate and report to Congress not later than January first, nineteen hundred and nine, the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of purchase and likewise of installation and the cost of maintenance and operation."

Under date of December 10, 1908, a commission of eight postal officials appointed by Postmaster General's order of June 19, 1908, to investigate and advise the Postmaster General as to the feasibility and desirability of the Government purchasing or installing equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service was then in operation, and also to ascertain and report the approximate cost of purchase, and likewise of installation, and the cost of maintenance and operation, submitted its report with the following conclusions:

1. The pneumatic-tube service is a very important auxiliary for the rapid transportation of first-class mail in the most important cities and performs a function not at present obtainable by other means.

2. Its constant availability makes it particularly appropriate for special-delivery mail, for all first-class mail of local origin for local delivery, for supplementary closings of first-class mail for dispatch by train, and for advance dispatches of first-class mail from trains for city delivery.

3. When established, it should also be employed, as far as possible and economically, for the transportation of other mail.

4. Registered mail should be sent by tube whenever security and celerity can be combined in practice.

5. Mechanically the tube service appears to be still in an experimental condition, although considerable progress has been made toward the development of a fixed standard of machinery.

6. With the above reservation the regularity and efficiency of the tube service is commendable.

7. As the present contracts call for the installation of 64½ miles of tube lines and as only 42½ miles are at present in operation, the tube companies should be required to complete their contracts without undue delay in order that the effect of full and complete systems toward increasing the special-delivery and other first-class mail may be ascertained by the department from actual experience.

8. The present contracts under which the tube companies are performing mail service will not expire until June 30, 1916, almost eight years hence. During that period there should be ample opportunity for the companies to perfect the systems and for the Post Office Department to observe the effect upon the Postal Service. Further, during that period it is possible that other methods of transportation will be developed or improved, so as to change entirely the outlook as it now appears. Five or six years hence, we believe, it will be advisable to renew the consideration of the question of Government ownership.

9. In view of the foregoing we consider it appropriate to advise you (the Postmaster General) that, in our opinion, it is not feasible and desirable at the present time for the Government to purchase, to install, or to operate the pneumatic tubes, and this is our unanimous judgment.

This report was transmitted by the Postmaster General to Congress on December 15, 1908, and was printed as House Document No. 1220, Sixtieth Congress, second session.

1909.

Congress, in the post-office appropriation bill approved May 27, 1908, for the fiscal year ended June 30, 1909, provided "for the transmission of mail by pneumatic tubes or other similar devices, $1,000,000; and the Postmaster General is hereby authorized to enter into contracts not exceeding in the aggregate $1,388,759 under the provisions of the law for a period not exceeding 10 years."

1910.

Congress, in the post-office appropriation bill approved March 1, 1909, for the fiscal year ended June 30, 1910, provided as follows: "For the transmission of mail by pneumatic tubes or other similar devices, $1,000,000."

Pneumatic-tube lines accepted during fiscal year ended June 30, 1910.

Route No.	City and state.	Length.	Annual pay.
	BOSTON, MASS.	*Miles.*	
504003	Additional length on Back Bay station and Station A circuits	0.122	$2,074.00
	NEW YORK, N. Y.		
507011	Additional length, Station V, new site	.1062	1,805.40
	Readjustment of distance between Grand Central and Times Square Stations	.0009	15.30
	Station H embraced	.1065	1,810.50
	Station O to Station C	.8883	15,101.10
		1.1019	18,732.30
	PHILADELPHIA, PA.		
510006	Reading Terminal and general post office	.2785	4,734.50
	Station O to North Philadelphia via Fairhill	1.799	30,583.00
		2.0775	35,317.50
	CHICAGO, ILL.		
	Post office and Chicago & Northwestern Depot	1.7958	30,528.60
	Grand total	5.0972	86,654.40

There was a decrease in length of 0.2243 mile, occasioned by the readjustment of distances between Station G and Station L, via Stations N, W, and J, decreasing annual pay $3,813.10.

The report of Second Assistant Postmaster General for that year states that the contract for service on route 507011, New York, required the completion of the entire mileage advertised by October 31, 1909, but that the contracting company was unable to complete the entire system by that date, the uncompleted portion being from Grand Central Postal Station by way of Stations Y, K, and U, to Station L, and the connection of Station S with the main line between the general post office and Station D, and that suitable arrangement was made whereby the lines could be completed at a later date.

At New York, N. Y., the following additional changes were noted:

Station F was removed to its new site November 1, 1908, but no steps were taken by the company to connect the station at the new site until during the fiscal year 1910. Station W was removed to a new site July 1, 1910, decreasing the distance on the West Side (uptown line) 0.2037 mile.

At Chicago, Ill., arrangements were made to connect Station U of the Chicago (Ill.) post office at its new site in the new terminal of the Chicago & North Western Railway.

1911.

Congress, in the Post Office appropriation bill approved May 12, 1910, for the fiscal year ended June 30, 1911, provided as follows: "For the transmission of mail by pneumatic tubes or other similar devices, $923,000."

Pneumatic-tube lines accepted during fiscal year ended June 30, 1911.

Route No.	City and State.	Length.	Annual pay.
	NEW YORK, N. Y.	*Miles.*	
507011	Grand Central Post Office Station to Station Y	1.3112	$22,290.40
	Station Y to Station K	1.1046	18,778.20
	Station K to Station U	.8287	14,087.90
	Station U to Station L	1.2462	21,185.40
	Embracing new Station F	.2146	3,648.20
	Embracing new Station A	.0237	402.90
		4.7290	80,393.00

Pneumatic-tube lines accepted during fiscal year ended June 30, 1911—Continued.

Route No.	City and State.	Length.	Annual pay.
	PHILADELPHIA, PA.		
510003	Readjustment of distance between general post office and Broad Street Station	*Miles.* 0.0067	$113.90
	Readjustment of distance between Broad Street Station and Station J, via Station C	.0062	105.40
		.0129	219.30
	Grand total	4.7419	80,612.30

There was a decrease in length of 0.8343 mile of the pneumatic-tube service in New York City, occasioned by changes in site of Stations O and W, change in tubes at Seventieth Street and Broadway, omission of old Station A, and readjustment of distances on East Side, including omission of old Station F, decreasing annual pay $14,183.10.

The report of Second Assistant Postmaster General for the year 1911 states that at New York, N. Y., the pneumatic-tube lines to connect the Grand Central Postal Station with Station L by way of Stations Y, K, and U were completed and placed in operation. A commission appointed by the Postmaster General recommended that an independent line of tubes be constructed from the general post office to Stations S and V, and that in connection therewith the contractor be required to connect Times Square Station by tubes with the new Pennsylvania Terminal Station. The company declined to connect the last-named station as required, and inasmuch as the proposal to establish the independent line to Stations S and V was coupled with the requirement to connect the new Pennsylvania Terminal Station, and the original requirement to connect Station S with the tube lines in operation was held in abeyance in the meantime, no action was taken by the company to connect Station S under the contract requirements. Station F, which was removed to its present site in November, 1908, was connected with the tube lines, and the operation of the tubes to that point was commenced January 9, 1911.

At Chicago, Ill., Canal Station of that office, located in the new Chicago & North Western Depot, has been connected since the close of the fiscal year 1911 by pneumatic tubes by an extension from Station U in the Union Depot, a distance of 0.4024 mile.

PROPOSED 30-INCH PNEUMATIC TUBES.

The act of Congress approved March 4, 1911, entitled "An act authorizing the Postmaster General to advertise for the construction of pneumatic tubes in the city of Cincinnati, State of Ohio," provided as follows:

"That the Postmaster General is hereby authorized to advertise for the construction of double lines of pneumatic tubes, thirty inches in diameter and not exceeding one mile in length, in the city of Cincinnati, Ohio, and to enter into contract for the operation of the same for the transmission of the mails, at a rate not exceeding seventeen thousand dollars per mile per annum, until June thirtieth, nineteen hundred and thirteen: *Provided*, That no contract shall be entered into until the proposed lines shall have been operated for mail purposes in a satisfactory manner for six months, without cost to the Government."

Under this authority an advertisement was issued inviting proposals for the construction of a double line of pneumatic tubes, 30 inches in diameter, to connect the post office with the Central Union Station, and for the operation of the same until June 30, 1913, under the terms of the statute. A proposal was received from the Universal Pneumatic Transmission Co., of Chicago, Ill., at the rate of $13,392.60 per annum for a line 0.79 mile in length, being at the maximum rate allowed by the statute, which was accepted by the department. The further statement is made that the company had taken steps to secure a franchise allowing the building and operation of the tubes.

1912.

Congress in the Post Office appropriation bill approved March 4, 1911, for the fiscal year ended June 30, 1912, provided as follows: "For the transmission of mail by pneumatic tubes or other similar devices, $966,800."

Pneumatic-tube lines accepted during fiscal year ended June 30, 1912.

Route No.	City and State.	Length.	Annual pay.
	NEW YORK, N. Y.	*Miles.*	
507011	Embracing new Station J	0.2174	$3,695.80
	Extension to new Station I	.3785	6,434.50
		.5959	10,130.30
	CHICAGO, ILL.		
535004	Extension to Canal Station	.4030	6,851.00
	Readjustment of distance between Station U (Union Depot) and La Salle Street Depot	.0049	83.30
	Embracing Twentieth Street Station (old Twenty-second Street Station)	.0107	181.90
		.4186	7,116.20
	Grand total	1.0145	17,246.50

There was a decrease in length on route No. 535004, Chicago, Ill., occasioned by the omission of Wells Street terminals, in the old Northwestern Depot, of 0.0227 mile, decreasing pay $385.90 per annum.

The report of Second Assistant Postmaster General for 1912 states that at New York, N. Y., Station S remained unconnected with the tube system. Station H (Morningside) was substituted by agreement with the contractor for Station I at the old site, and was therefore covered by the pneumatic-tube contract, and that it was found desirable to connect Station I at its new site between Stations H and J with the tube lines. The necessary extension and connection of the line with that station having been made, operation of the tube service to Station I at its new site commenced June 27, 1912.

At St. Louis, Mo., the tube connection of the post office in the new Federal building with the tube system was made October 28, 1912.

PNEUMATIC-TUBE COMMISSION.

The act of Congress approved August 24, 1912, making appropriations for the service of the Post Office Department for the fiscal year ended June 30, 1913, contains the following provision:

"That a commission consisting of two members of the Committee on Post Offices and Post Roads, United States Senate, and two members of the Committee on the Post Office and Post Roads, House of Representatives, to be appointed by the chairman of the respective committees, and the Second Assistant Postmaster General, is hereby authorized to investigate the feasibility and desirability of the Government purchasing and operating the equipment for pneumatic-tube service in the cities in which such service is now installed, together with rights to operate and extend equipment in such cities and elsewhere, and to ascertain the cost at which such purchase may be made. The employment of expert and other assistance is authorized, and the expense of such and of the inquiry shall be paid from the appropriation for service by pneumatic tubes, and said commission shall make a report, with recommendations, to Congress at the earliest practicable date."

1913.

Congress, in the post office appropriation bill, approved August 24, 1912, for the fiscal year ended June 30, 1913, provided as follows: "for the transmission of mail by pneumatic-tube or other similar devices, $987,400."

Pneumatic-tube lines accepted during fiscal year ended June 30, 1913.

Route No.	City and State.	Length.	Annual pay.
	NEW YORK, N. Y.	*Miles.*	
507011	Readjustment of distance in Center Street account of subway construction.	0.0121	$205.70
	ST. LOUIS, MO.		
545002	Embracing new general post office	.0415	705.50

There was a decrease in tube lines at St. Louis, incident to omitting Annex Station of that post office at the time the new post-office building was connected, of 0.0588 mile. The increase shown above is the net result of the changes.

The report of Second Assistant Postmaster General for the fiscal year 1913 stated that at New York, N. Y., Station S remained unconnected with the tube system; that arrangements had been made to connect the new post-office building with the tube system by a line of tubes extending from the junction of Eighth Avenue and West Thirty-fifth Street along Eighth Avenue to the new post-office building, approximately 0.43 mile; also to disconnect at Times Square Station the present 8-inch double tube in operation between the Grand Central Station and Times Square Station, and extend said line along West Thirty-ninth Street to Eighth Avenue, thence on Eighth Avenue into the new post-office building, approximately 0.4947 mile, and the elimination of that portion of the tube lines on Seventh Avenue connecting Station E with the West Side trunk line of tubes, approximately 0.2794 mile.

At Chicago, Ill., Kinzie Street Station had been omitted from the tube system, decreasing distance 0.1731 mile, and a connection of the Chicago Avenue Station, located at 210 West Chicago Avenue, with the tube system of route 535004 was made August 1, 1913. The extension of the tube lines to Chicago Avenue Station resulted in an increase of 0.6057 mile.

PROPOSED 30-INCH PNEUMATIC TUBES.

The acceptance of the proposal of the Universal Pneumatic Transmission Co. for the construction and operation of a 30-inch pneumatic tube at Cincinnati, Ohio, contemplated the commencement of the six months' experimental service on December 2, 1911. As the company was not in a position to begin the performance of the service on that date, an extension of time was granted to April 13, 1912, and later a further extension was granted to September 15, 1912. The company was unable to begin the service on the latter date and requested a still further extension to April 1, 1913. For the reason that the company would not have been able to construct the tube and perform the six months' experimental service before June 30, 1913, when the authority granted by the statute expired, the extension to April 1, 1913, was not granted, and as no assurance was received from the company that it would be prepared to proceed further with the construction of the tubes, no extension of the authority granted by the statute was requested.

PNEUMATIC-TUBE COMMISSION.

The act of Congress approved March 4, 1913, making appropriations for the service of the Post Office Department for the fiscal year ended June 30, 1914, contains the following provision:

"That the personnel of the membership of the committees and commissions created and provided for in sections one and eight of the act entitled 'An act making appropriations for the service of the Post Office Department for the fiscal year ending June thirtieth, nineteen hundred and thirteen, and for other purposes,' approved August twenty-fourth, nineteen hundred and twelve, shall continue with the same authorities, powers, and provisions for expenses until final report is made to Congress, which shall be made on or before March fourth, nineteen hundred and fourteen."

1914.

Congress, in the Post Office appropriation bill approved March 4, 1913, for the fiscal year ended June 30, 1914, provided as follows: "for the transmission of mail by pneumatic tubes or other similar devices, $962,200."

At New York, N. Y., the new post-office building was connected with the west side tube lines. By this extension the new post office became one of the principal points on the system.

The act of Congress approved March 9, 1914, making appropriations for the service of the Post Office Department for the fiscal year ending June 30, 1915, extended the time in which the commission is required to make a report to December 1, 1914.

Pneumatic-tube lines accepted up to June 30, 1914, during the fiscal year of 1914.

Route No.	City and State.	Length.	Annual pay.
	NEW YORK, N. Y.		
507011	Embracing new general post office	*Miles.* 0.9180	$15,606.90
	CHICAGO, ILL.		
535004	Embracing Chicago Avenue Station in place of Kinzie Station.	.6057	10,296.90

With the connection of Chicago Avenue Station, tube lines from Kinzie Station to intersection of Wells and North Water Streets were disconnected, omitting 0.1731 mile in length of double lines of pneumatic tubes, decreasing pay at the rate of $2,942.70 per annum.

APPENDIX B.

American Pneumatic Service Co.,
161 Devonshire Street, Boston, May 27, 1914.

Hon. Hoke Smith,
Chairman, Pneumatic Tube Postal Commission,
United States Senate, Washington, D. C.

Sir: At our conference in Washington on May 22 you requested us to submit, on behalf of the owners, prices at which they will sell and convey to the United States the pneumatic mail tube systems in New York, Brooklyn, Boston, Chicago, and St. Louis.

We understand you desire these prices to be submitted in accordance with the following propositions:

1. A total price for all the systems located in the cities above named.
2. A total price for all the systems with the exception of the Chicago system.
3. A separate price for each system.

Since your engineer's and auditor's reports were submitted, extensions and additions have been made to the systems in New York and Chicago, a statement of which is given in this letter.

The price for proposition No. 1 is $6,300,000. To this is to be added expenditures, since your engineer's and auditor's reports, amounting to $142,102.14, making a grand total of $6,442,102.14.

The price for proposition No. 2 is $5,659,794.06.

The prices for proposition No. 3 for the different systems separately at the time of your engineer's and auditor's reports are as follows:

New York and Brooklyn	$4, 950. 000. 00
Chicago	750, 000. 00
Boston	450, 000. 00
St. Louis	150, 000. 00
	6, 300, 000. 00

The prices for each system, including the additional expenditures for extensions and improvements since your engineer's and auditor's reports, are:

New York and Brooklyn	$5. 059, 794. 06
Chicago	782, 308. 08
Boston	450, 000. 00
St. Louis	150, 000. 00
	6, 442, 102. 14

The statement of expenditures for extensions and improvements since your engineer's and auditor's reports is made up as follows:

Additions to plant accounts:		
Chicago—		
Cost of Kinzie extension	$29, 778. 23	
Cost of refrigerating plant	2, 529. 85	
		$32, 308. 08
New York—		
Station J	13, 222. 08	
Station I	19, 989. 78	
Pennsylvania terminal extension	64, 582. 20	
Refrigerating plants	12, 000. 00	
		109, 794. 06
		142, 102. 14

Yours, respectfully,

Wm. H. Ames, *President.*

APPENDIX C.

Pneumatic Transit Co.,
Third and Chestnut Streets, Philadelphia, Pa., May 5, 1914.

Hon. Hoke Smith,
Chairman Joint Congressional Pneumatic Tube Commission,
Washington, D. C.

Dear Sir: We do not see our way to revise the tender submitted June 16, 1913, for a cash purchase of the Philadelphia system by the Post Office Department. That tender therefore remains, but we have decided to outline more in detail a plan of amortized contracts which, if acceptable to your commission, Congress, and the Government, will, we believe, solve the problem in an equitable manner, satisfactory in its immediate and ultimate workings to the interest of all concerned.

To avoid misunderstanding in the use of terms permit us to say that by amortization is meant that for the return of the capital invested a sinking fund is to be created which, in this instance, will be obtained by adding such a sum to the annual rental paid by the Government as will within a certain number of years by compounding interest amount to an equivalent of the company's capital securities outstanding, $1,700,000.

To put the case more concretely: The Government has never paid this company less than $17,000 per mile in annual rental for a double line of postal tubes, recognizing as the result of careful investigation that no company can afford to carry the mail and use its system exclusively for that purpose at a lower figure if any return is to be made upon the capital invested in the enterprise. To show precisely the financial results we take from the latest audit of this company's books, that made by the chartered accountants, Messrs. Lybrand, Ross Bros. & Montgomery, for the year ending December 31, 1913, which shows the total income of the company (9.9999 miles at $17,000 per mile), $169,998.30.

OBLIGATIONS.

Preferred stock—$1,000,000, 6 per cent (balance to be issued, $3,100). Issued	$996,900.00
Common stock, all issued	500,000.00
First mortgage 5 per cent bonds outstanding	200,000.00
Profits from operation for the year	76,958.74
Less interest on bonded indebtedness	10,000.00
Net profit	66,958.74
Dividend on preferred stock	59,814.00
Balance applicable to surplus for dividend on common stock	7,144.74

This is the actual surplus available only with the most careful management, carried to such economical lengths that even the president and secretary serve without salary, and answers a question recently asked by one member of your commission, viz, if out of the present Government rental it would be possible for the company to lay aside a sufficient annuity to retire the capital in 25 years. It is manifestly impossible, for the common-stock holders are certainly entitled to this surplus of $7,000 or any more up to 6 per cent at least, inasmuch as they have never received a penny of dividend, though the company has been doing business and carrying mails to the satisfaction of the Government for more than 20 years, since February, 1893.

The standard annuity tables show—

$1 invested at 4 per cent, 25 payments, 24 years' interest	$41.65
The annuity invested at 4 per cent to amortize $1,700,000, the capitalization of the Pneumatic Transit Co., would be $1,700,000 divided by $41.65	40,816.32
Total mileage of Philadelphia system, 10 miles, annuity per mile to be invested	4,081.63
Present rental per mile per annum	17,000.00
Necessary rental to amortize $1,700,000 in 25 annual payments, 24 years' interest	21,081.63

This sum is based upon a 4 per cent investment of the sinking fund because in the judgment of conservative financiers 4 per cent is a safe basis of calculation; a certain element of risk attends a higher rate of interest, while anything lower is quite unnecessary from the standpoint of safety. In explaining the difference between the figures quoted here and those employed, $20,897.40, in our letter touching on this point sent last summer (June 16, 1913), it is only necessary to set out that the company is calculating upon receiving its payments as now—not in annual installments, but every month.

Our company will agree to annul the present 10-year contract expiring July 1, 1916, and substitute in its place one drawn on the lines indicated above, agreeing to carry on the service the same as at present and maintain the required standard of efficiency, giving the Government an assignment of all inventions and improvements in the Philadelphia-Camden district, and finally turn over the system at the end of the contract period to the Post Office Department in first-class condition, free and clear of all indebtedness.

The company will agree also upon the execution of such a contract as indicated, to provide the necessary capital to build all extensions either in the form of pneumatic tubes or electrical tunnels on this amortized plan, or simply act as the Government's constructing agent in this work at the ordinary contractor's profit of not less than 10 per cent nor more than 15 per cent on actual cost, guaranteeing in every instance successful operation and assuming full responsibility for the entire construction. The Government would be thus entirely free to extend the service either as its own, providing the capital, or authorize us to do so and rent it from us as outlined. The territory controlled by this company, as you are aware, includes the city of Philadelphia and within a radius of 20 miles of the city of Camden, N. J.

To sum up, the Government would merely extend the company's present contract from 10 to 25 years and increase the annual rental by $3,897 per mile, which is, we have been told, only $897 more than the commission which originally investigated the pneumatic tube were in favor of paying the company—that is $20,000 per mile—a sum that would have permitted the payment of something to the common-stock holders who have been patiently waiting for it these 20 years. The whole increased annual expense to the Government for the system by which it will ultimately become owner according to the proposed plan, will amount for the city of Philadelphia to less than $40,000; that is to say, by increasing this company's present rental $38,970 per year the Government will acquire the plant without disturbing existing arrangements or changing the present order of things.

This proposition meets a situation that has been precipitated by the actualities and further possibilities of war. It involves no large cash outlay, nor does it impose any serious additional burden upon the Government. It improves without disturbing existing conditions, renders further progress possible by additional extensions, and is at once in keeping with the whole trend of modern methods, providing, in an equitable scientific manner, for the acquisition of an important system of transportation which has through more than 20 years' actual service demonstrated the indispensible character to the Government.

Respectfully submitted.

Pneumatic Transit Co.,
By C. T. Harrop, *Secretary.*

Pneumatic Transit Co.,
Third and Chestnut Streets, Philadelphia, Pa., June 16, 1913.

Hon. Hoke Smith,
Chairman Congressional Committee In re Pneumatic Tubes,
Washington, D. C.

Dear Sir: Your commission for several months has had before it the investigation of mail transportation by pneumatic tubes and other devices and the question of acquiring by the Government the various postal tube plants now in operation. Much testimony has been taken, but no complete, comprehensive appraisal in any city has been made heretofore, so far as we are aware, either by the Government, by this, or any other company.

An auditing of the books of the various companies by the American Audit Co., last winter, was followed with a physical valuation by the Government engineers, but, of course, no corporation, judicial or rate-fixing body, here or abroad, would consider a physical valuation more than a partial enumeration of assets, nor do we believe that you commission, the representatives of an enlightened Government, would take any other view of such proceeding.

That the whole matter might be presented in a scientific manner that is in keeping with recognized modern business methods, as now in vogue with the public utilities commissions of New York, Wisconsin, Massachusetts, and other States having such organizations, this company invited two firms, the American Appraisal Co. of Wisconsin and Messrs. Van Gelder, Knoeppel & Young, of New York, representing established authority in the matter of corporation appraisals to pass upon the value of our properties.

The findings of the latter firm, as will be seen, comprises a complete valuation of the entire assets, including the physical valuation certified to by the American Appraisal Co. We trust you will find these reports to be as clear in statement as they are intended to be comprehensive in scope and sound in the methods employed in arriving at conclusions, which are, in their finality, that the value of our property is $1,703,978.30.

These figures, you will observe, are about $300,000 lower than we worked out in a detailed statement submitted to your commission sometime ago. We are quite prepared to defend the figures that we then set forth, but we think it only fair that you should have before you the views of the agencies whose regular profession is to ascertain values, regardless of either party in the negotiations, according to the most modern advanced system of computing the financial worth of corporations.

We submit, therefore, their reports with this observation, that we do not think these public appraisers have taken in or given due consideration to all the values that enter into the property. This we think can be easily shown. They apparently have leaned throughout their reasoning to the ultra conservative side, as may be quickly verified by any other accredited appraisal firm or firms of corresponding rank.

But the time has come, we think, to submit our own conclusions of the matter and we do so in the form of an alternative offer to the Post Office Department, either in the nature of an outright sale, or, if your commission prefers it so, on the basis of a long-term lease, including in such lease that at its expiration the title of the tube property shall be vested in the United States Government. Expressed more in detail, the proposition may be thus summarized:

(1) In consideration of $2,000,000—which is less than a dozen years of the present annual rental ($170,000) paid in advance—the company will sell to the Post Office Department the 10 miles of double mail-tube lines (20 miles lineal measurement), together with all machinery, terminals, material on hand, shop equipment; also rights to use all patents owned or acquired hereafter, franchises and all property used and incidental to the transportation of the mails by means of pneumatic tubes, together with the electrical tunnel rights, or those of other similar devices, in the Philadelphia-Camden district; or

(2) It will lease its existing tube lines, terminals, machinery, etc., to the United States Post Office Department, on terms similar to the existing contracts of lease governing the operation of pneumatic tubes, for a period of 25 years from the date of execution, in consideration of the annual payment of $20,897 per mile, instead of as now $17,000 per mile, and at the expiration of such lease, the pneumatic tube system shall become the property of the United States Post Office Department, free and clear of any and all liens or encumbrances of every kind, nature, and description and turned over in first-class condition.

(3) Should the Government prefer and accept the second proposition, this company will agree to build and construct for the Post Office Department in the Philadelphia-Camden district, in all future pneumatic tube extensions, and any and all electrical underground tunnels, or any other systems of mail transportation that is now or may hereafter be acquired or controlled by the company, which the Government may require and designate, at actual cost plus the ordinary contractor's profit of not less than 10 per cent nor more than 15 per cent, and guarantee in every instance the successful operation of the systems of transportation so constructed.

All of which is respectfully submitted.

PNEUMATIC TRANSIT CO.,
By CHAS. T. HARROP,
Secretary.

THE AMERICAN APPRAISAL CO.,
New York, N. Y., May 16, 1913.

THE PNEUMATIC TRANSIT CO.,
Philadelphia, Pa.

GENTLEMEN: In compliance with your instructions we have made an appraisal of your physical property.

This appraisal covers power-generating plants, receiving and transmitting stations, underground tubes, electric wiring, and everything pertaining to the actual cost of the installation of the pneumatic mail tube system.

The figures we have arrived at include contractors' profit, engineers' fee, plans, superintendence, and inspection during construction, and are as follows:

Replacement value, new	$826, 611
Sound or depreciated value, after making due allowance for wear and tear, based on age and present condition	781, 694

We consider the above valuation to be conservative, and believe they represent the fair value of this property at the present time.

Attached hereto you will find a summary showing both replacement value and sound value of the various stations, including also such items as supplies, extra carriers, and machine-shop equipment.

Yours, very truly,

THE AMERICAN APPRAISAL CO.,
By W. C. FROEMKE, *Manager.*
H. E. HAWKES, *Appraiser.*

The Pneumatic Transit Co., Philadelphia, Pa.—Summary of stations, lines, supplies, etc.

	Reproductive.	Depreciated.
9.9999 miles of lines, including carriers	$589, 866	$575, 120
North Philadelphia Station	9, 786	8, 199
Philadelphia Bourse Station	4, 220	3, 376
Fairhill Station	14, 687	12, 806
Station J	26, 063	22, 457
Station O	17, 000	14, 960
Philadelphia & Reading Station	3, 901	3, 687
Central post office	47, 428	41, 686
Station S	24, 688	20, 726
Southwark	17, 013	14, 652
Station D	15, 969	13. 692
Broad Street Station	17, 937	15, 861
Station C	15, 806	13, 225
Machine shop	3, 862	2, 862
Supplies, extra carriers, etc	18, 385	18, 385
Total	826, 611	781, 694

THE AMERICAN APPRAISAL CO.,
W. C. FROEMKE, *Manager.*
H. E. HAWKES, *Appraiser.*

VAN GELDER, KNOEPPEL & YOUNG,
ENGINEERS AND ACCOUNTANTS,
55 Liberty Street, New York, May 28, 1913.

PNEUMATIC TRANSIT CO.,
Philadelphia, Pa.

GENTLEMEN: In accordance with your request, we have prepared and are submitting herewith a statement of your fixed assets as of January 3, 1913, as follows:

Plant and equipment, Schedule A	$781, 694. 00
Patent rights, Schedule B	300, 000. 00
Organization, Schedule C	172, 487. 00
Going value, Schedule D	299, 797. 30
Contracts	150, 000. 00
Total	1, 703, 978. 30

The valuation of your plant and equipment as herein shown was made by the American Appraisal Co., copy of whose report forms Schedule A hereof.

The patent rights consist of the Philadelphia rights in all patents and inventions owned or obtained by the Batcheller Pneumatic Tube Co. during the entire period of its existence. These rights were purchased on December 15, 1892, the consideration being $200,000 of your company's common stock. As this contract had been mislaid at the time of our examination, we were furnished with a certificate from the directors of the Batcheller Pneumatic Tube Co., setting forth the contents thereof.

Also included in the item of patent rights are the Philadelphia rights in what is known as the Electric Dispatch System, which your company acquired on January 3, 1913, for $100,000 of its preferred stock.

The amount included for organization represents the overhead on construction, which is based on reasonable percentages of the reproductive cost of the plant as at the time of construction. The actual amounts expended by your company were so far in excess of the amounts usually allowed that we have not attempted to use them in determining what should constitute a fair charge for the same.

The going value of your business comprises the cost of developing the same from the commencement of operation to the present time. Your company has not yet reached the state of a true going concern, due to the fact that the rate obtained for its services has not been sufficient to enable it to cover normal operating expenses. The annual deficit arising from this condition is, therefore, considered as a proper charge to your going value, as being so much additional money put into development.

We are advised that a contract is pending covering the use of a device called the "time lock," for which an application for patent was made on November 1, 1911, by Robert Ball (serial number of which is 658081). Under the terms of this contract your company obtains the use of this device on the payment of a royalty of one-half of the saving in the electric power consumed, which royalty is approximately $12,500 per annum. A release from such royalties may be secured by the payment of a lump sum of $150,000, thereby securing a complete title to the license to use this device in the city of Philadelphia and within a radius of 20 miles of Camden, N. J., and on this basis your company values the same at $150,000.

Yours, very truly,

Van Gelder, Knoeppel & Young.

F. W. Witherell,
Engineer in charge.

The American Appraisal Co.,
New York, N. Y., May 16, 1913.

Pneumatic Transit Co., *Philadelphia, Pa.*

Gentlemen: In compliance with your instructions, we have made an appraisal of your physical property.

This appraisal covers power-generating plants, receiving and transmitting stations, underground tubes, electric wiring, and everything pertaining to the actual cost of the installation of the pneumatic mail tube system.

The figures we have arrived at include contractors' profit, engineers' fees, plans, superintendence and inspection during construction, and are as follows:

Replacement value, new	$826, 611
Sound or depreciated value, after making due allowance for wear and tear, based on age and present condition	781, 694

We consider the above valuation to be conservative and believe they represent the fair value of this property at the present time.

Attached hereto you will find a summary showing both replacement value and sound value of the various stations, including also such items as supplies, extra carriers and machine-shop equipment.

Yours, very truly,

The American Appraisal Co.
By W. C. Froemke,
Manager.
By H. E. Hawkes,
Appraiser.

(Schedule A.)

The Pneumatic Transit Co., Philadelphia, Pa.—Summary of stations, lines, supplies, etc.

	Reproductive.	Depreciated.
9.9999 miles of lines, including carriers	$589,866	$575,120
North Philadelphia Station	9,786	8,199
Philadelphia Bourse Station	4,220	3,376
Fairhill Station	14,687	12,806
Station J	26,063	22,457
Station C[1]	17,000	14,960
Philadelphia and Reading Station	3,901	3,687
Central post office	47,428	41,686
Station B[2]	24,688	20,726
Southwark	17,013	14,652
Station D	15,969	13,692
Broad Street Station	17,937	15,861
Station C	15,806	13,225
Machine shop	3,862	2,862
Supplies, extra carriers, etc	18,385	18,385
Total	826,611	781,694

THE AMERICAN APPRAISAL CO.
W. C. FROEMKE,
Manager.
H. E. HAWKES,
Appraiser.

(Schedule A.)

[1] Error; should be Station O.
[2] Error; should be Station S.

PATENT RIGHTS.

The following patents have been obtained by the Batcheller Pneumatic Tube Co., and your company is entitled, under the terms of the agreement executed December 15, 1892, to use the same in Philadelphia and within a radius of 20 miles of Camden, N. J.:

No.	Date of issue.	Inventor.	No.	Date of issue.	Inventor.
567,067	Sept. 1, 1896	B. C. Batcheller.	683,387	Sept. 24, 1901	Cowley.
568,291	Sept. 22, 1896	Do.	684,715	Oct. 15, 1901	Pike.
585,498	June 29, 1897	Do.	685,674	Oct. 29, 1901	Cowley.
585,647	July 6, 1897	Do.	689,043	Dec. 17, 1901	Fordyce.
590,181	Sept. 14, 1897	Do.	698,830	Apr. 29, 1902	Do.
595,754	Dec. 21, 1897	Do.	703,120	June 24, 1902	Danley.
595,755	do	Do.	706,639	Aug. 12, 1902	Cowley.
595,756	do	Do.	722,562	Mar. 10, 1903	Burton.
602,422	Apr. 19, 1898	Do.	726,022	Apr. 21, 1903	Do.
623,968	May 2, 1899	Do.	726,017	do	Blanchaud.
623,969	do	Do.	626,097	do	Pike.
623,970	do	Do.	742,513	Oct. 27, 1903	Stoddard.
623,971	do	Do.	742,514	do	Do.
623,972	do	Do.	742,515	do	Do.
623,973	do	Do.	742,516	do	Do.
657,078	Sept. 4, 1900	Do.	742,517	do	Do.
657,079	do	Do.	742,390	do	Burton.
666,175	Jan. 15, 1901	Do.	758,562	May 24, 1904	Stoddard.
700,607	May 20, 1902	Do.	760,658	do	Do.
706,291	Aug. 5, 1902	Do.	760,569	do	Do.
707,071	Aug. 19, 1902	Do.	768,030	Mar. 23, 1904	Burton.
721,476	Feb. 24, 1903	Do.	768,031	Aug. 23, 1904	Do.
722,667	Mar. 17, 1903	Do.	772,973	Oct. 25, 1904	Stoddard.
746,266	Dec. 8, 1903	Do.	775,949	Nov. 29, 1904	Do.
746,267	do	Do.	779,638	Jan. 10, 1905	Burton.
749,152	Jan. 12, 1904	Do.	780,595	Jan. 24, 1905	Do.
627,181	June 20, 1899	Fordyce.	782,106	Feb. 7, 1905	Stoddard.
635,434	Oct. 24, 1899	Do.	783,151	Feb. 21, 1905	Do.
654,690	July 31, 1900	Townsend.	784,225	Mar. 7, 1905	Pike.
666,747	Jan. 29, 1901	Fordyce.	790,456	May 23, 1905	Do.
683,022	Sept. 24, 1901	Cowley	790,457	do	Do.
683,140	do	Pike.	796,263	Aug. 1, 1905	Stoddard.
683,141	do	Do.	800,884	Oct. 3, 1905	Do.

The following patents and applications cover what is known as the Electric Dispatch System:

No.	Date of issue.	Inventor.	No.	Date of issue.	Inventor.
1,040,810	Aug. 22, 1912	K. E. Stuart.	581,208[1]	Pending	K. E. Stuart.
104,811	Oct. 10, 1912	Do.	693,973[1]	do	Do.
693,974[1]	do	Do.			

[1] Serial number.

(Schedule B.)

ORGANIZATION.

In determining the charges properly included in this item, we have used the following percentages, which are supported by numerous decisions of the courts and commissions having jurisdiction in these matters:

	Per cent.	
Promotion and preliminary expense	3	$20,699
Legal expenses in connection with organization and construction	1	6,899
Preliminary financing	2	13,798
Discount on securities	12	82,794
Interest during construction	5	34,498
Contingencies	2	13,799
Total	25	172,487

Among the more recent decisions and awards bearing on these matters are the following:

In the appraisal of the Chicago Consolidated Traction Co., made in accordance with the ordinance passed October 10, 1910, the following percentages were allowed:

	Per cent.
Organization, engineering, and incidentals	14.6
Legal expenses, interest, and contingencies	5.8
Conducting work, furnishing equipment, and brokerage	18.0
Total	38.4

The New York Public Service Commission, first district, re Metropolitan Street Railway Co., reorganization 3, Public Service Commission, first district (N. Y.), 113,165, decided February 27, 1912, discusses this feature as follows:

"There are certain expenses connected with every undertaking which are not represented by physical property, but which must be incurred before the undertaking is operated. Lawyers and engineers must be consulted. Permits must be secured. Interest and taxes during the period of construction must be paid, and as there are no earnings, they must be included as part of the cost of the undertaking. There are also other expenses connected with the experimental and trial operation of machinery and the adjustment of various parts of the enterprise, which antedate operation."

"Ordinarily, one would expect that the company itself would have data upon which to base an estimate of a reasonable allowance for these items, but no such data have been produced. In other cases decided by the commission, when an estimate has been necessary, the amounts allowed for promotion of the original scheme, the securing of rights and permits, experimental operation, adjustment of system, preliminary legal fees, and technical advice have varied from 5½ to 8 per cent of the reproduction cost of the plant plus the cost of the land." (Whitten, 266.)

During the past few years the public service commissions have approved the issuing of bonds at discount varying from zero to 25 per cent, depending upon the local conditions and the corporation being considered. The Railroad Commission of Wisconsin has found it necessary to permit the selling of bonds at not less than 75, whereas the Public Service Commission of New York State has usually fixed 85 as the minimum price, although in a number of instances authorizing the sale of bonds as low as 80. As indicating average figures it is interesting to note that the Public Service Commission of New York, second district, reported that it had authorized in 1908 $63,000,000 bonds, par value, to be issued, carrying an average rate of interest of 4.29 per cent, which brought an average price of sale of 88. The same commission, in 1909, authorized $39,000,000 of bonds which sold at 87.6, so that, for New York

State, not including New York City, a discount of about 12 per cent would seem to be an average figure.

The Wisconsin Railroad Commission has made an allowance for the cost of financing both in condemnation and rate cases. In the case of Hill *v.* Antigo Water Co., decided August 3, 1909, we find the following:

"The plant in question here, for instance, was built by borrowed money, or by the sale of securities which not only bear interest at 6 per cent from the time they were issued, but which also had to be discounted at not less than 8 per cent besides. In other words, they brought 8 per cent less than par value in the money markets. If the plant was needed and these were the best terms upon which the capital for its construction could be obtained, it is certainly difficult to see what other disposition can be made of these charges than to include them in the cost of the plant, at least until they can be written off from earnings, if this course should be found to be advisable. For it is clear that no private party would enter a business of this kind if they had to foot such losses out of their own pockets. Such interests and discounts, therefore, often constitute a part of the price upon which the consumers must pay interest if they desire the conveniences that are offered by the utilities, because these are usually the best terms upon which such utilities can be had. These facts indicate quite clearly that the amount for which interest or discount that it may become necessary to include in the construction account, is a question that depends upon the facts in each particular case, and that it is a matter that can not always be determined in advance."

In the matter of an allowance for interest during construction, the New York Public Service Commission of the first district usually allows 6 per cent as a proper rate.

The United States Supreme Court, in the Consolidated Gas case, upheld the master's allowance of a total of 5 per cent on the value of the entire plant, while the railroad commission of Wisconsin has uniformly adopted the rate of 6 per cent per annum for interest during construction. In discussing the matter the railroad commission of Wisconsin (State Journal Printing Co. *v.* Madison Gas & Electric Co., Mar. 8, 1910) sets forth its views as follows:

"Respondent claimed that interest during construction should be computed at the rate of 6 per cent. That interest for such purpose is a proper item of value is indisputable. Where the plant construction is financed by borrowing, the use of such money must be paid for in form of interest. Where the corporation finances itself and no money is borrowed, an interest charge is nevertheless incurred for the money thus occupied during construction is entitled to current interest for the period so engaged. The amount to be allowed for the purpose of valuation from a theoretical standpoint at least should be at the current rate for the money from the time when financing must be arranged, directly preceding the beginning of construction, until the completion of the plant. It is not difficult to conceive of conditions under which the interest as so computed would be a very large item, since organization and franchise expenses and land purchases may be long in advance of actual construction."

In regard to the item of contingencies, further reference is made to the Wisconsin railroad commission, which has uniformly added a small percentage for the same. A case in point is that of the City of Beloit *v.* Beloit Water, Gas & Electric Co., decided July 19, 1911 (7 W. R. C. R., 187, 239):

"It is ordinarily impossible for the designer of plants, such as those involved herein, to foresee the exact conditions and contingencies which may be encountered in the actual construction work. This is true to some extent even where specifications and estimates are drawn by men of large experience and familiarity with local conditions. Again, it is seldom but what departures are made from specifications, due to new inventions, changes of policy on the part of those in control of the work, the encountering of unforeseen conditions, and for numerous other reasons. In fact, specifications are often purposely left open in some particulars to permit of changes due to later decisions by those in charge. On the other hand, the cost of reproduction of such properties is made after the plant has been completed and with all units and equipment in place and the plant in operation. Access is often had in valuation work of this kind to the books and records showing the actual cost of construction of all or a part of the physical property. Again, where unusual conditions were met in the construction work which called for particular skill and caused additional expense not provided for in the original estimates, these circumstances are not commonly permitted to escape the attention of those conducting the inventory and appraisal."

(Schedule C.)

GOING VALUE.

The following statement shows the accumulated deficit arising from the difference between normal charges for operating expenses, administration, depreciation, and interest, and the gross revenue received by your company from the commencement of operation to December 31, 1912:

Operating expenses	$682,916.00
Administration	210,250.00
Depreciation	150,410.00
Interest	376,110.00
Total charges	1,419,686.00
Gross revenue received	1,119,888.70
Deficit	299,797.30

The charges, revenue, and deficit for each year are shown in the following statement:

Year.	General operating expenses.	Administration.	Depreciation.	Interest.	Total.	Revenue.	Deficit.
1893	$10,000.00	$4,250.00	$1,290.00	$3,230.00	$18,770.00	None.	$18,770.00
1894	20,850.00	6,000.00	1,290.00	3,230.00	31,370.00	$3,400.00	27,970.00
1895	12,100.00	7,000.00	1,290.00	3,230.00	23,620.00	3,400.00	20,220.00
1896	12,100.00	7,000.00	1,290.00	3,230.00	23,620.00	3,400.00	20,220.00
1897	12,100.00	8,000.00	1,290.00	3,230.00	24,620.00	3,400.00	21,220.00
1898	12,900.00	9,000.00	3,250.00	8,120.00	33,270.00	34,566.00	*1,296.00*
1899	16,000.00	10,000.00	3,250.00	8,120.00	37,370.00	40,966.00	*3,596.00*
1900	16,000.00	10,000.00	3,250.00	8,120.00	37,370.00	40,966.00	*3,596.00*
1901	8,700.00	10,000.00	3,250.00	8,120.00	30,070.00	21,493.00	8,577.00
1902	8,800.00	10,000.00	3,250.00	8,120.00	30,170.00	19,482.26	10,687.74
1903	16,000.00	11,000.00	3,250.00	8,120.00	38,370.00	33,358.80	5,011.20
1904	16,000.00	11,000.00	3,250.00	8,120.00	38,370.00	25,514.00	12,856.00
1905	16,000.00	11,000.00	3,250.00	8,120.00	38,370.00	24,504.00	13,866.00
1906	43,000.00	12,000.00	8,780.00	21,900.00	85,680.00	62,778.67	22,901.33
1907	46,686.00	12,000.00	8,780.00	21,900.00	89,366.00	66,120.65	23,245.35
1908	71,410.00	13,000.00	13,600.00	34,100.00	132,110.00	106,342.06	25,767.94
1909	78,500.00	14,000.00	19,000.00	47,500.00	159,000.00	134,856.04	24,143.96
1910	91,282.00	15,000.00	21,400.00	53,600.00	181,282.00	155,344.63	25,937.37
1911	91,988.00	15,000.00	23,200.00	58,000.00	188,188.00	169,998.29	18,189.71
1912	82,500.00	15,000.00	23,200.00	58,000.00	178,700.00	169,998.30	8,701.70
Total	682,916.00	210,250.00	150,410.00	376,110.00	1,419,686.00	1,119,888.70	299,797.30

The operating expenses have wherever possible been taken from the books and records of your company, and where these figures were not available have been estimated on the basis of the length of line and amount of equipment in use. To these figures have been added the cost of line changes and supersession of machinery.

The books of your company do not disclose any charges for administration. Our understanding is that the officers of your company acted without charge and devoted their time and services to the interest of the company, thus creating equities in the property, and incidentally enhancing the value of their holdings, as they were all substantial stockholders in the company. The figures included, therefore, are those furnished to us by the officials of your company as constituting a fair charge for their services.

The depreciation charged each year has been based on the life of the various parts of your plant, which we estimate to be as follows:

	Years.
Pipe line	100
Machinery, average	25
Carriers	10

The average depreciation based on the above being 2.4 per cent.

The amount included for interest on invested capital is based on 6 per cent of the cost of construction plus overhead.

The revenue taken is the gross amount of revenue received by your company, as shown by your books and records.

The following decisions affecting going value are cited:

In the case of the Norwich Gas & Electric Co. *v.* The City of Norwich, Conn., decided April 14, 1904 (75 Conn., 565; 57 Atl., 746), Judge Baldwin, of the supreme court of errors, delivered the opinion of the court, as follows:

"It was also proper for the commission to pay regard to the fact that the plaintiff had an established business, built up after experiments and changes during a long period. (Gloucester Water Supply Co. *v.* Gloucester, 179 Mass., 365; 60 N. E., 977.) The commission reports that it considered, in connection with these facts, that the plaintiff's business had been thus 'built up at the risk of private capital.' It indisputably had been so built up, and whatever had been sunk in experiments in order to secure, and with the result of securing, a good working plant was properly considered as entering to some extent into the value of that plant" (pp. 751, 752).

In the case of the City of Omaha *v.* The Omaha Water Co. (218 U. S., 180; 30 Sup. Ct., 615; 54 L. ed., 991, May 31, 1910), Justice Lurton, of the Supreme Court of the United States, delivered the opinion of the court, as follows:

"The appraisers in making their estimate of valuation included $562,712.45 for the 'going value.' This separation of an element contributing to the value of each tangible part was done because required to be done under an order made in the circuit court in a suit in which the water board of the city of Omaha was complainant and the members of the board of appraisers and the water company were defendants. The object of that suit was to instruct the appraisers in respect to the mode and manner in which they should proceed. An order resulted which required the board to report the separate elements making up the aggregate value of the plant.

"The option to purchase excluded any value on account of unexpired franchise; but it did not limit the value to the bare bones of the plant, its physical properties, such as its lands, its machinery, its water pipes or settling reservoirs, nor to what it would take to reproduce each of its physical features. The value in equity and justice must include whatever is contributed by the fact of the connection of the items making a complete and operating plant. The difference between a dead plant and a live one is a real value, and is independent of any franchise to go on, or any mere good will as between such a plant and its customers. That kind of good will, as suggested in Willcox *v.* Consolidated Gas Co. (212 U. S., 19), is of little or no commercial value when the business is, as here, a natural monopoly, with which the customer must deal, whether he will or no. That there is a difference between even the cost of duplication, less depreciation, of the elements making up the water company plant and the commercial value of the business as a going concern is evident."

In the case of the Gloucester Water Supply Co. *v.* The City of Gloucester (179 Mass., 365; 60 N. E., 977), Judge Loring delivered the opinion of the court, as follows:

"It is plain that the real commercial market value of the property of the water company is, or may be, in fact, greater than 'the cost of reproduction, less depreciation, of the different features of the physical plant.' Take, for example, a manufacturing plant. Suppose one manufacturing plant has been established for some 10 years and is doing a good business and is sold as a going concern. It will sell for more on the market than a similar plant reproduced physically would sell for immediately on its completion, before it had acquired any business. (National Waterworks of New York *v.* Kansas City, 10 C. C. A., 653; 62 Fed., 853; 27 U. S. App., 165.) We think it is plain that there is nothing in the provisions of section 16 of the act in question (St. 1895, c. 451) forbidding the commissioners considering this element of value, which, as we have seen, in fact exists * * *."

(Schedule D.)

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